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Vol. 30 No. 2
April 1954

ECONOMIC GEOGRAPHY

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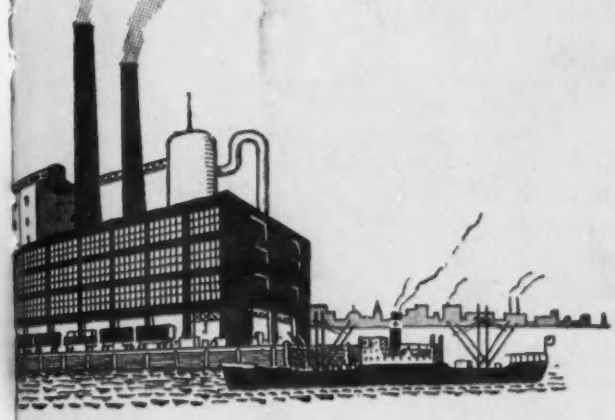

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Regular subscription rates (except to charter subscribers) are $6.00 per year or $11.50 for two years (plus 50c per year for mailing charges outside the United States and its Territories and Canada) payable in full in United States dollars at Worcester, Mass.

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ECONOMIC GEOGRAPHY

Editorial and Business Offices: 950 Main Street, Worcester, Mass.

Published Quarterly at
Commonwealth Press, 44 Portland Street, Worcester, Mass.

PRICE, $1.85 THE CURRENT NUMBER SIX DOLLARS A YEAR
(except for charter subscribers)

Entered as second class matter at the Post Office at Worcester, Mass.
under the Act of August 24, 1912

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ECONOMIC GEOGRAPHY

VOL. 30 APRIL, 1954 NO. 2

AN APPROACH TO A THEORY OF ECONOMIC GEOGRAPHY

H. H. McCarty

Professor McCarty is chairman of the Department of Geography at The State University of Iowa.

STUDENTS of economic geography have often expressed a desire for a body of theory that would expedite and give direction to research in their field. In recent years, particularly, it has appeared to many people that both the growing complexity of the discipline and the increased opportunities for practical application of its findings have made this need more apparent than ever before. If we are to accept the idea that economic geography is becoming the branch of human knowledge whose function is to account for the location of economic activities on the various portions of the earth's surface, it seems reasonable to expect the discipline to develop a body of theory to facilitate the performance of this task.

I

At the outset it seems desirable to inquire into the most probable and desirable characteristics of such a body of theory, if one were to come into existence. Certainly it would consist, in essence, of a large number of interrelated and non-contradictory principles each of which would account for the location of some type of economic activity. With such a group of principles the geographer would be able to provide satisfactory explanations of the location of the world's agricultural regions, manufacturing industries, and all other types of economic occupance. These principles would be essentially similar to those developed by other physical and social sciences, except that they would be concerned with *locations* rather than with those physical and social processes which are the main concern of the systematic sciences.

In the early stages of development, it seems reasonable to assume that such principles as were available would be of severely restricted applicability. Some would be restricted topically and would be concerned solely with locational relationships between two or three variables, such as rainfall or temperatures and yields of a particular crop. Topically-restricted generalizations of this type are familiar features of the systematic sciences.

In another way, however, it appears that geographical principles may be restricted in ways that are uncommon in other sciences: they may be restricted areally. In the past, the major theoretical contributions to economic geography have been of this type, presenting generalizations that are applicable to a continent, a state, or an even smaller area. Thus we may well envision early

development of a number of "bodies of theory" each of which would be applicable only to areas such as the United States, or Western Europe, or the Middle West. Much of the ensuing research would obviously be concerned with expanding these small "universes" into larger ones. The areally-restricted principle seems to be an almost exclusively geographic concept, however, and the possibility of evolving a more general body of theory by this method appears to have encouraging methodological implications. This process of developing generalizations by working from small areas to larger ones is the central feature of what is occasionally referred to as the "geographic approach" to scientific investigation.

Thus it appears that the earliest contributions to a body of theory would consist of both areally-restricted and topically-restricted generalizations. We shall soon remind the reader that a significant volume of both types of research has already been turned out by economic geographers. But before we take that step, it seems desirable to inquire into the basic assumptions that underlie these kinds of locational principles.

II

In economic geography, as in many other sciences, two sorts of explanations have been employed. In earlier days, when the phenomena seemed considerably simpler than at present, it was fashionable to speak of the *causes* of certain locational patterns, and, of course, adequate explanation consisted of discovering, listing, and evaluating all of those causes. In its simplest form a locational principle was presumed to state that a certain economic phenomenon, which we may call x, had come to occupy an area because certain (physical and social) factors, which we may call a, b, and c, *caused* that phenomenon to locate there. In other words, all such locations were viewed as the results of certain locational processes and to understand those processes one must identify the factors which created them. Thus it appears that since a, b, and c are the causes of the location of x, wherever one finds a, b, and c one will also find x. The reader will readily recognize the fact that this approach has been employed extensively by both economists and geographers in their studies of the location of economic activities. Many students feel, however, that the search for causes can never produce an adequate body of theory for use in economic geography.

Difficulties which have arisen in connection with the search for causes of the locations of individual economic activities are associated with the complexity of locational processes. As the science of economic geography progressed, the list of factors that had some bearing on locations became longer and longer. Economic geographers found themselves delving into such diverse fields as genetics, geophysics, engineering, and social psychology in their search for basic causes of the locational processes they were attempting to explain. Little wonder that the system produced few principles! Variables became so numerous that they were not manageable, and, in consequence, solutions to locational problems were not obtainable.

In economic geography, as in many other sciences, a partial solution to this procedural problem has come from shifting the emphasis from cause to association. By this procedure (which is as old as field observation) the analyst's major goal is to discover types of phenomena whose patterns of areal distribution resemble those of the eco-

nomic phenomenon he is investigating. No longer insistent that *a*, *b*, and *c* are *causes* of the location of *x*, he is quite content to find that *wherever* one finds *a*, *b*, and *c*, one *also* finds *x*. This emphasis on areal association is a very old feature of geography and it has always been emphasized in field studies. Its proponents take the pragmatic view that if one knew that two phenomena always appear together in space and never appear independently, the needs of geographic science would be satisfied, and there would be scant additional virtue in knowing that the location of one phenomenon caused the location of another. Beyond these considerations, however, lies the very practical fact that in accepting the significance of these relationships the analyst is freed from the obligation to track down every element that might have a bearing on his problem and to relate that element to the processes that are presumed to have brought about the locational pattern he is trying to explain. Therein lies the main reason for concluding that principles composing a body of theory would be stated mainly in terms of areal association rather than cause and effect. Let us inquire briefly into the manner in which these principles would most likely be derived.

III

We have already expressed an opinion that, in the beginning, the building-blocks for a body of theory would consist of principles whose applicability is restricted either areally or topically or both areally and topically. We know, too, that the literature already contains reports of a considerable number of both types of studies. To what extent may the results of these studies be made a starting point in the formulation of a body of theory? At first blush, it appears that a satisfactory beginning could be made simply by devising a set of categories and fitting the various studies into that classificational system. All of us know, however, that such an effort would be abortive, primarily because research procedures employed in the various studies have varied so widely that extensive comparisons among them are impossible. As a result the interchange of ideas concerning research findings has been kept at a low level and the advancement of theory has been retarded accordingly. There should be merit in reviewing some of the major causes of this lack of communication among students of locational problems. In particular, let us attempt to identify the stages followed by an economic geographer as he pursues a research study and inquire into the extent to which the various operations should be described if the report is to be of maximum value to other members of the profession. These operations may be conveniently discussed under two headings: first is the statement of the problem, which involves identification, measurement, and location; second is the process of analysis, whose importance merits a separate section in our discussion. First, however, let us turn to procedures involved in stating the problem.

Before any research is undertaken a decision must be reached as to the scope of the investigation. Operational definitions are set up covering the topics to be investigated and categories for classifying the data are established. The importance of accurate definition and classification of the phenomena under investigation is apparent to every student of economic geography. Certainly a great many studies have proved valueless to later investigators because their authors either failed to identify precisely the subject matter of the

inquiry or employed unorthodox systems of classification that made their findings not comparable with those of other researchers in the field. Most geographers will agree that there is great need for development of new and more useful systems of classification in economic geography; but it also seems evident that these innovations should come as a result of specialized inquiries and not as an incidental feature of studies devoted to substantive research. There seems to be great need to utilize systems of classification that are already generally accepted in the profession; otherwise, there is no assurance that comparable results will be attained in research projects.

The second phase of setting up a research problem normally is concerned with measurement of the phenomena under investigation. Here we soon discover that we are dealing with aggregations of facts which must be measured and for which a variety of types of measurement is available. There are, for example, questions of whether measurements shall be in terms of acres, bushels, dollars, or other units. In addition, the investigator is faced with problems of whether to measure all elements in his problem or employ a sampling procedure; or to employ averages or other measures of central tendency. Often he is confronted with the problem of selecting a year or other data-collecting period that might be considered as "normal." All students who have tackled problems in economic geography know the importance of reaching adequate decisions concerning these and numerous other problems of measurement. They also know that methods of measurement must be selected primarily in terms of the nature of the problem and characteristics of the data. Thus there is room for a variety of treatments and genuine disagreement among scholars as to which of several measures best performs the tasks indicated by the problem. Few researchers would contend that any system is best for all possible purposes; but all would agree that the analyst is obligated to give an adequate account of the sources of his data and the ways in which the data were manipulated in conducting the analysis. If this sort of information is not provided in the report, it will be impossible for other analysts to investigate the accuracy of the work and as a result the widespread checking that is so desirable among scholars who work on similar problems cannot be carried on. The list of procedural techniques that may be used, and therefore must be noted and identified in the report, is almost endless. The very fact that so many of them are available makes it all the more important that they be described in the report.

The final phase in stating the problem normally consists of preparing some sort of statement of the location of the phenomena which have already been identified and measured. Although such statements may be in tabular form the usual procedure is to present them graphically in the form of maps. In this phase of the work the record of performance is very good. Economic geographers have in nearly all cases prepared excellent maps showing distributions of the data with which their investigations are concerned. These maps, adequately annotated and documented, may be said to constitute statements of problems in economic geography. How are we to go about the task of accounting for the unevenness of distribution which these maps show? Pursuit of the answer to this question leads us into the analytical phases of research in economic geography.

IV

Before we approach the problem of analysis it seems desirable to emphasize the fact that in all research procedures accurate description is prerequisite to analysis. It follows, therefore, that accurate description is a perfectly laudable goal *in itself*, and that it really makes no difference whether this descriptive material becomes a basis for analysis by its author or by some other person. But it is entirely proper, on the other hand, to insist that all descriptive materials be presented *accurately* and in such form that they may be analyzed. Thus it appears that even the most ardent analyst may not condemn a work because it is "mere description"—his condemnation must surely be withheld unless the description is of such a nature that it cannot be used as a basis for further research.

The analysis itself seems normally to take the form of a search for phenomena whose distribution throughout the area under investigation resembles the distribution of the phenomenon with which the "problem" is concerned. We have already indicated that some analysts prefer to concentrate their efforts on phenomena which may be considered as causing the distributions encountered in the problem while others are content to establish the extent of areal association between (or among) various phenomena. Let us examine the manner in which analytical procedures may be affected by pursuit of one or the other of these attitudes.

We may approach this inquiry by assuming that we have set up a problem involving the location of wheat production and are presently trying to account for the distribution of areas in which wheat occupies more than half the harvested cropland. We are looking for generalizations in the form of, "Wheat occupies more than half the cropland wherever *a*, *b*, and *c* are present." It follows, of course, that if any of these elements, *a*, *b*, or *c*, is absent in a particular area, wheat will occupy less than half the cropland. Other (and perhaps more significant) problems may be posed by our data, but for the present our interest is confined to the one we have stated.

The problem itself has now been clearly stated and is ready to be translated into a form that will be most conducive to a solution. We have placed all of our land-use areas into two categories according to whether they have more-than or less-than half their harvested cropland in wheat. Locational patterns are established by plotting locations of these categories on a map. We are now ready to undertake an inquiry to determine why those patterns (rather than countless others) have come into existence. How shall we conduct this inquiry?

We have already noted the fact that two divergent approaches to this type of problem have been employed. One of them focuses attention on the characteristics of the activity itself and is concerned with discovering how *processes* involved in its appearance and existence may *lead to* differences in location. The other approach begins with an examination of actual locations to discover what conditions may be common to all areas in which the phenomenon is found, but do not exist elsewhere. In the case of wheat, the "process" approach would first gather data (primarily from botany, economics, and other systematic sciences) descriptive of conditions necessary for successful production of wheat. The investigator would then focus his attention on those factors that seemed most likely to vary from one area to another. Eventually he should be able to erect a hypothesis

to the effect that, "One would *expect* wheat to be dominant wherever *a*, *b*, and *c* are present." Testing such a hypothesis would consist essentially of determining the locations (usually on maps) of *a*, *b*, and *c*, and comparing them with the locations of areas dominated by wheat as stated in the problem under investigation. The result would normally appear as some sort of measurement of the degree of association between *a*, *b*, and *c* (or some combination of *a*, *b*, and *c*) and land dominated by wheat as stated in the problem. Geographers have generally relied on the coefficient of correlation to perform this function.[1]

Thus the analyst is provided with a measurement of the likelihood that *x* will appear wherever *a*, *b*, and *c* are present. Rarely, indeed, will he be satisfied with the figure he has obtained and his thoughts will almost invariably be directed toward speculation as to whether a better correlation could be obtained by altering the area under study or substituting new elements for *a*, *b*, and *c* in the hypothesis. At the moment, however, he may take satisfaction in having arrived at a solution for one phase of the general problem upon which he is working.

Extension of the inquiry will carry it in directions indicated by the interests of the investigators. Since few of them are likely to be interested in the 50 per cent land-use analysis for wheat in a specific area, we may expect other investigations to be concerned with other percentages of land use; still other investigations are likely to be devoted to extending these same kinds of analysis to other areas of wheat production. Allied studies involving yields per acre, percentages of farm income derived from wheat, and specific varieties of wheat are almost certain to appear.

Each of these studies will be based upon and related to those that have previously appeared. In practice, these prior studies provide the bases for the hypotheses that are used in the later inquiries. Almost automatically, therefore, the aggregation of principles that appears is homogeneous and internally consistent.[2]

V

The nub of the problem of research procedure seems to lie in finding the best technique for discovering *a*, *b*, and *c* in the "where *a*, *b*, *c*, there *x*" hypothesis. All analysts agree to the necessity of erecting such a hypothesis in order to give direction to the analysis. But where shall we search for its components? The problem is a very practical one. Out of hundreds of possible explanations, which ones are most likely to be significant? Since time and money are always limited, some clue to this problem is badly needed. One source of such clues lies in the findings of the systematic sciences. The other source lies in the observations of trained workers in the field or in the library.

The research student soon discovers the fruitfulness of prior studies as a source of generalizations concerning correlations between the locations of specific economic activities and other areally-distributed phenomena. Many of these generalizations are of small

[1] For a discussion of relationships between processes and locations see Preston E. James: "Toward a Further Understanding of the Regional Concept," *Annals of Assn. Amer. Geogrs.*, Vol. 42, 1952, pp. 195–222. Prominent studies employing coefficients of correlation are John K. Rose: "Corn Yield and Climate in the Corn Belt," *Geogr. Rev.*, Vol. 26, 1936, pp. 88–102; and John C. Weaver: "Climatic Relations of American Barley Production," *Geogr. Rev.*, Vol. 33, 1943, pp. 569–588.

[2] Many authors have used hypotheses and visual correlation techniques, but see Lyle E. Gibson: "Characteristics of a Regional Margin in the Corn and Dairy Belts," *Annals of Assn. Amer. Geogrs.*, Vol. 38, 1948, pp. 244–270.

scientific value because they apply only to restricted areas; but the researcher may very well start his analysis of the same topic in some other area by basing his original hypothesis on those findings. He will be very likely to discover that some modification is necessary if the generalizations developed for the other area are to be made applicable to this one. But if it can be changed to make it fit both areas, it has become much more valuable; and a small start has been made on what one day, after much testing and restatement, may well become a full-fledged principle that will be applicable to large sections of the earth's surface or even (ultimately) to the whole world.

Unlike other sciences, geography can find great use for principles that are applicable only to relatively small portions of the earth's surface. A fruitful method of inaugurating the research that will discover those principles is to utilize as hypotheses the observations concerning areal associations of phenomena that have come from areally-restricted studies of individual economic activities. It goes without saying that accurate description and a complete reporting of findings are essential features of such a program. But there is ample reason to believe that these procedures will, by using a distinctively geographic method, produce a distinctively geographic body of theory that will contribute materially to the world's fund of knowledge.

THE HASHEMITE KINGDOM OF THE JORDAN: A STUDY IN ECONOMIC GEOGRAPHY

S. Van Valkenburg

Dr. Van Valkenburg, Director of the Graduate School of Geography, Clark University, spent several weeks in Jordania in the fall of 1952.

THE Hashemite Kingdom of the Jordan, to give the state its official title, is an artificial creation. Generally considered part of Greater Syria, it was included in the British Mandate of Palestine—while the northern part of Greater Syria went to France—and later was arbitrarily separated from Palestine under a separate mandate as that part which was not involved in the Jewish National Home. In 1946 it became an independent kingdom, but strong ties still connect it with Britain which more or less controls the army and occupies military bases. In 1949, after the war between the Arab States and Israel, part of former Palestine west of the Jordan River was included and the name changed from Transjordania to Jordania as the country is now commonly called.

Jordania, as a state, faces great difficulties. It has very little to sell to the outside world, either from the point of view of minerals or of agriculture. Most of the people are poor, even very poor. The new addition of territory brought about the difficulty of uniting two sections and two groups of people, of different economic and social status even if both are Arabs. Moreover, the large number of refugees who fled Israel at the time of the war is an additional burden. Democratic in name only, because most of the people are not ready for democracy, and ruled by a young king who has still to make his reputation, one wonders what the future will be and whether Jordania can exist without continued foreign financial help. At the same time its location as the keystone of the Arab World gives a much greater importance to Jordania than its number of people (1.33 million) would indicate. This article, based on a rather intensive visit to that country in the fall of 1952, stresses only the economic angle but may help to evaluate a small Arab state which arose through historical circumstances and has to find its way in order to continue to exist, if it does not lose its identity by joining its Arab neighbors.

Relief

The general distribution of major relief features in the neighborhood of Jordania is so well known that it needs only a brief statement. In sequence from west to east there are the coastal plain, the western uplands, the Jordan Rift, and the eastern uplands which drop eastward into what is generally called the Syrian desert. Jordania only touches the coastal plain at Tulkarm and the adjacent Plain of Esdraelon, a low connection between the coast and the Jordan, at Jenin. Consequently, only three main divisions are involved: the Jordan Rift and its two rim uplands.

This regularity is disturbed in the southern part of the area east of the Rift, here called Wadi Araba. The wall of limestone and sandstone, typical for the region to the north, is replaced

by granite mountains (Sha'fat Ibn Jad) which in spots rise above 5000 feet and continue along the eastern side of the Gulf of Aqaba. The limestone plateau ends by way of a steep escarpment which extends eastward. To the south of that escarpment and east of the granite mountain is a sandstone basin with isolated island mountains of bizarre shape. The basin has a narrow outlet to the Gulf of Aqaba by way of the Wadi el Yutm. Details about terrain will be discussed in the regional description.

CLIMATIC CONTROL

Jordania has a typical Mediterranean type of climate—mild winters, except where elevation comes into the picture, warm summers, and with practically all its precipitation during the winter period. From the point of view of agriculture the most critical points are the yearly averages and the deviations from that average (Fig. 1). However, temperatures, both winter and summer, also have to be considered.

Temperature conditions can be illustrated by three examples—Jerusalem, Jericho, and Amman. Jerusalem and Amman have about the same elevation (2500 feet) and winter temperatures are similar, namely 47° for the coldest months, which means frost on clear nights and occasional snow. Summer temperatures are five degrees higher in Amman—80 versus 75 for the warmest month—a case of continentality versus a near coastal location. But in both instances summer temperatures are far from extreme and for anyone coming in summer from Baghdad, Amman is a welcome relief. Jericho, 820 feet below sea level, has a January temperature of 57° F., with no danger of either frost or snow, an excellent winter climate. However, the summers are quite warm (88° in July and August). Agriculturally, it is important that the temperatures in winter in the uplands do not exceed 50° F. which means higher effectiveness of the precipitation which falls during that period.

The map of yearly precipitation is not difficult to understand. The amount decreases from north to south and from west to east. Because the moisture comes from the Mediterranean, brought by westerly winds, the influence of elevation is clearly recognizable as well as the windward and leeward locations. The uplands east of the Jordan owe much of their precipitation to the fact that they are higher than the uplands to the west and are able to squeeze some moisture out of the passing air mass.

From an agricultural point of view, ignoring for a moment relief and soils, three isohyets are of major importance, namely, those representing an average of 16 inches, 8 inches, and 4 inches of precipitation respectively. The area having above 16 inches can have winter and summer crops in rotation and is suitable for fruit trees and vineyards. The area with between 16 and 8 inches is used for winter cereal (wheat, barley), and 4 inches is the limit for any effort to raise crops (see the discussion of land use).

Deviation of precipitation is roughly 50 per cent. This means that along the 16 inch isohyet the precipitation will rarely fall below 8 inches, and although crops may suffer during dry years and yields may be low there will be a harvest. Along the 8 inch line there are many years when the crop fails or the yields are extremely low; the area between the 8 and 4 inch lines will have a decent crop only under unusually favorable conditions. Again it is necessary to call attention to the fact that these remarks count only for areas with a cool winter. Those sections with warm winters are generally too dry to be of any agricul-

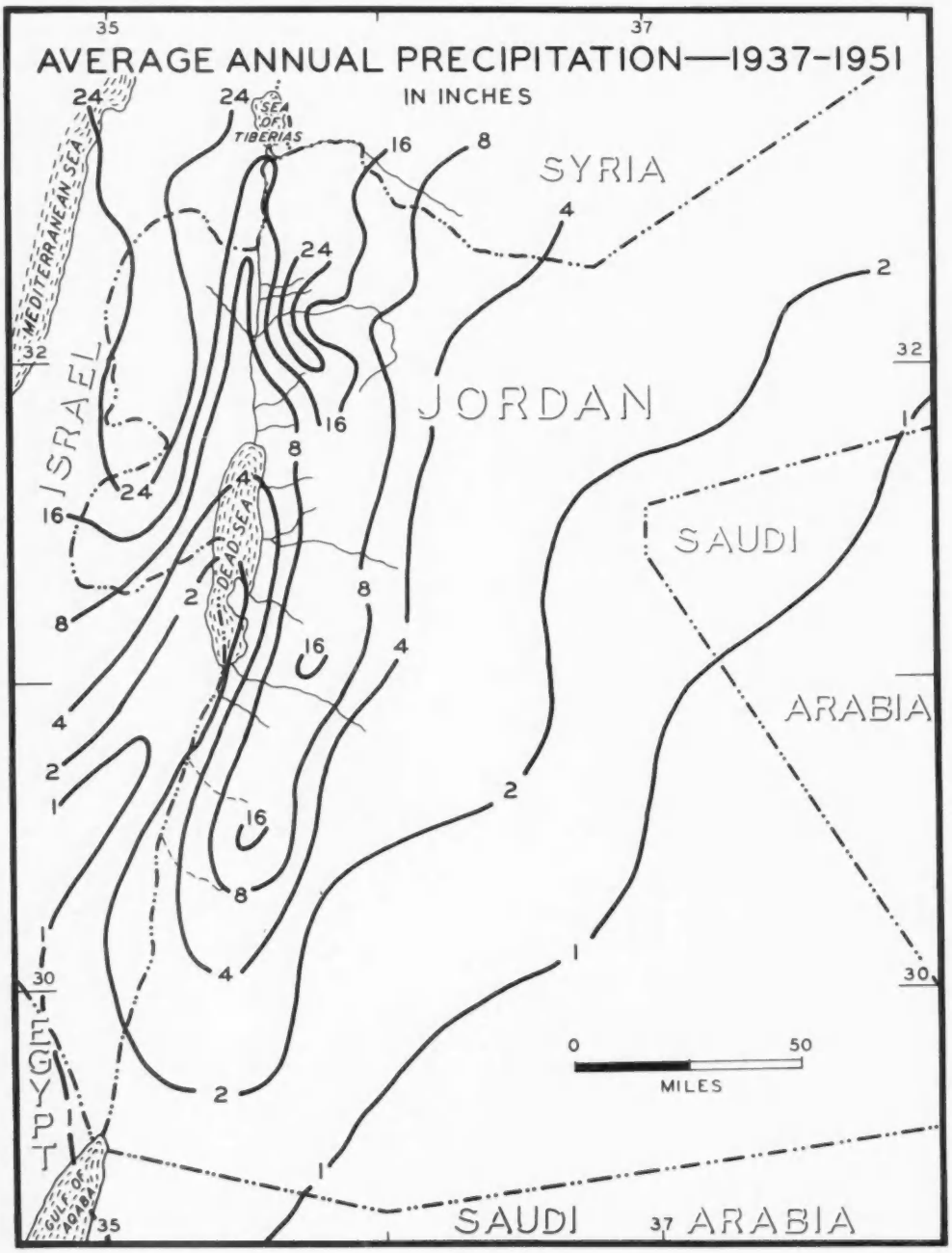
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FIG. 1

tural value except through irrigation. On the uplands in northern Jordania as well as west of the rift, the rainfall increases above 24 inches, and those areas are, climatically speaking, the best for agricultural use of the land.

Dew, so important in parts of Israel, enters the picture as a factor on the western uplands only where the annual dewfall reaches about 4 inches, of which the greater part occurs during the summer months.[1] In eastern Jordania it is almost negligible. In Amman, for instance, there is dew on an average of 70 nights a year but almost all of these fall in the winter rainy season.

LAND USE

The ancient system of permitting the fields to lie fallow for a considerable length of time is now being gradually replaced by a regular rotation system with winter crops (wheat and barley), summer crops (millet, corn, vegetables, and melons), and legumes. A typical sequence for a three-year period is a winter crop for the first year, a summer crop the second, and legumes in the winter of the third year. The accumulated moisture of the second winter is the base for the summer crop of the second year.

This, however, is applicable only to those areas with a precipitation above 16 inches. Below that amount only winter crops can be raised. Reference has already been made to the importance of the three basic isohyets, those of 16, 8, and 4 inches. The author, while crossing Jordania in all directions, was greatly impressed by how much, relatively speaking, can be done with so little, and how ingenious the Arab farmer has become through hard experience over many centuries in preserving the moisture brought by infrequent rains. Here is an extreme case described by B. A. Lowe at the conference of Middle East Agricultural Development held at Cairo in 1944.[2] He refers to the production of barley at the 4 inch isohyet in the Negeb, now part of Israel, but what he says is equally true for parts of Jordania. Sowing is done by broadcast, when the rains appear in late September or October among the stubbles and dry weeds, and the simple nail plow, a triangle of metal drawn by a camel, a mule, or both, is brought into action to loosen the surface and bury the grass. If rain falls sufficiently the seed germinates and the harvest in April or May gives yields of 600 pounds per acre. If the rain fails, no barley. It is estimated that crops run on a seven-year cycle: three "good" crops; three partial successes, when a little more is reaped than sown; and one total failure. This, of course, is only possible when the winters are cool, not above 50°, and the loss of moisture through evaporation during that period is small.

In the area of heavier precipitation, deeper plowing (up to 16 inches) is advisable to preserve winter moisture for the summer crop. This is done before the rainy season starts, if possible with a tractor. Successive nail plowings during the winter maintain the loose absorptive surface.

In general, Jordania does not have the problem of large land holdings, the curse of many Arab countries. In most parts, the Mushaa tenure system prevails, which means village ownership, whereas the individual ownership is a term of shares or fractions of a share out of a fixed and immutable total for the whole village. The owner has the right to cultivate his parts for

[1] D. Ashbell: "Frequency and Distribution of Dew in Palestine," *Geogr. Rev.*, Vol. 39, 1949, pp. 291–297.

[2] B. A. Lowe: "Agricultural Report No. 6," Middle East Supply Center, Cairo, 1944.

a period not less than two years. After that a new partition is made. This Mushaa system has great disadvantages. The individual holdings are scattered and quite small. Sometimes the ground is cultivated by one farmer while the trees on it belong to another farmer. Even individual trees are sometimes subdivided and a farmer gets a part of the crop of one tree. Owners, of course, try to get as much immediate profit as possible, without regard for the future. Moreover, quarrels about partition are frequent, especially in cases of inheritance. Under the able direction of G. F. Walpole, Director of Lands and Surveys of the Jordanian Government, the villages under the Mushaa tenure are gradually being transformed into a system of permanent partition. The new partition is made with the cooperation of the villagers. The Partition Office first prepares a schedule of rights, then holds sittings in the village to hear complaints against that schedule. Finally, the partitions are made and the new units are mapped on a scale 1:2500. During the partition the officer values each unit for land tax. This evaluation is made in terms of production, for instance on the number of bushels of wheat each acre can grow. Also, forests are demarcated and registered in the name of the government. In some hilly districts where viniculture and olive culture prevail the villagers themselves had already succeeded in making permanent partitions.

Irrigation on a large scale is still absent in Jordania, but the Yarmuk Dam which should soon be under construction will change that picture and the irrigation of the terraces on either side of the Jordan River will become feasible (see regional description). At present, irrigation is limited to narrow belts or spots along the few perennial rivers and to the alluvial fans those rivers have formed in the Rift, also locally to the many springs and wells. Nothing is more fascinating than to see on the bare rocky slope of a wadi a sudden outburst of green, a profusion of fruit trees (figs and pomegranates), melons, and vegetables, all based on a single spring. A typical example is the small settlement of Aina on the north slope of the Wadi Hasa. The spring irrigation at Tafila and at Shaubak is much larger. Springs in the eastern desert are few in number. The oasis of Ma'an is based on a spring which is caught in a tunnel of ancient structure. Of greater dimension is the group of springs along the Azraq depression, which borders the volcanic rocks of the southern extension of the Jebel Druz. M. G. Ionides[3] tells about a flow of 2 million gallons a day from the largest of these springs, the water coming from great distances.

Stock raising has a dual function. It is complementary to the agriculture (donkeys and camels), and in the areas too dry for crops it becomes the chief economic activity (sheep, goats, and camels). Herding is of the nomadic type but follows definite routes.

Efforts have been made to increase the grazing capacity of the steppe and deserts during the infrequent rainstorms. Below 4 inches is the steppe or desert where only extensive grazing is possible. This is the home of the Bedawin with his tribal structure and his disregard of political boundaries. In summer the Bedawin moves into the uplands in search of food for his flocks of camels, sheep, and goats; in fall, he returns to the desert for his winter pasture. The author had the good fortune to see the return to the desert of one of the largest tribes. It was impossible to count the camels, but there

[3] M. G. Ionides: "Water Resources of Trans Jordan and Their Development," published by Crown Agents for the Colonies, London, March, 1939.

must have been almost 1000 covering a wide area and carrying the household goods of the members of the tribes as well as the women and children. Herds of goats and sheep also took part in the migration.

LAND USE REGIONS

The following is an effort to divide Jordania into land use regions (Fig. 2). Those of former Palestine follow the well-known pattern, described in many publications, but those of former Transjordania are new and may help in the understanding of that area. The major headings are taken from physiography—the Western Uplands, the Rift with its two slopes, and the Eastern Uplands—but the boundaries used for the subdivisions are to a major extent climatic.

The Western Uplands

Only a part of the Western Uplands is located in Jordania; the greater part is in Israel and along the west side of the Rift connects with the Sinai Mountains of Egypt. The Jordanian section of these uplands can be divided into two subdivisions on the basis of relief.

1. Judea Plateau. Jordania controls the greater part of the Judea Plateau but not the Sephela which forms the transition to the coastal plain. Geologically the Plateau is a limestone block with a tendency toward karst topography. It is generally rolling, with ridges and with depressions, often without outlets and drained underground. Except in these depressions the soils are shallow and rock outcrops frequent. The quality of the soils, when they are available, is good, and cereals, fruit, and vegetables do well. The author will never forget the large tomatoes grown around Hebron, the best he ever saw. Slopes are often planted with olive trees of which the famous Mount of Olives, northeast of Jerusalem, is the outstanding example. Springs still add to the water supply of the old city of Jerusalem. The northern limit of the Judea Plateau is drawn just south of the tourist resort, Ramallah; this is not as far north as it is generally drawn.

2. The Samaria Hills. Samaria is much more dissected into ranges and wide valleys than Judea. It is less high and resembles, as many writers have said, the Appalachian landscape. The valleys are well cultivated and the slopes of the ridges, especially those facing the west, are covered with olive trees. Small plots of citrus trees occur, but most of the citrus fruit production is on the Israel coastal plain. Grapes are important, especially on the contact between Judea and Samaria, and the wine of Latrun, a Jordania salient cutting the road Jaffa-Jerusalem, is quite palatable. On the leeward sides, grazing becomes important, and as in biblical times flocks of sheep and goats can be found around the wells. In Tulkarm the edge of the coastal plain is reached (A on Fig. 2); in the north, around Jenin, Jordania extends slightly into the Vale of Esdraelon (B) with its deep fertile soils.

The Rift

The Rift Valley forms a perfect physiographic unit but geographically, because of differences in water supply, has to be subdivided into five sections, of which two are formed by the western and eastern rims. The northernmost section of the valley itself is located south of Lake Tiberias and east of the Jordan and continues southward to the point where the Jordanian boundary extends westward; the second section occupies the rest of the Jordan Valley; the third covers the shores of the Dead Sea and the Wadi Araba down to the Gulf of Aqaba. In the first unit of the valley proper there is sufficient rainfall;

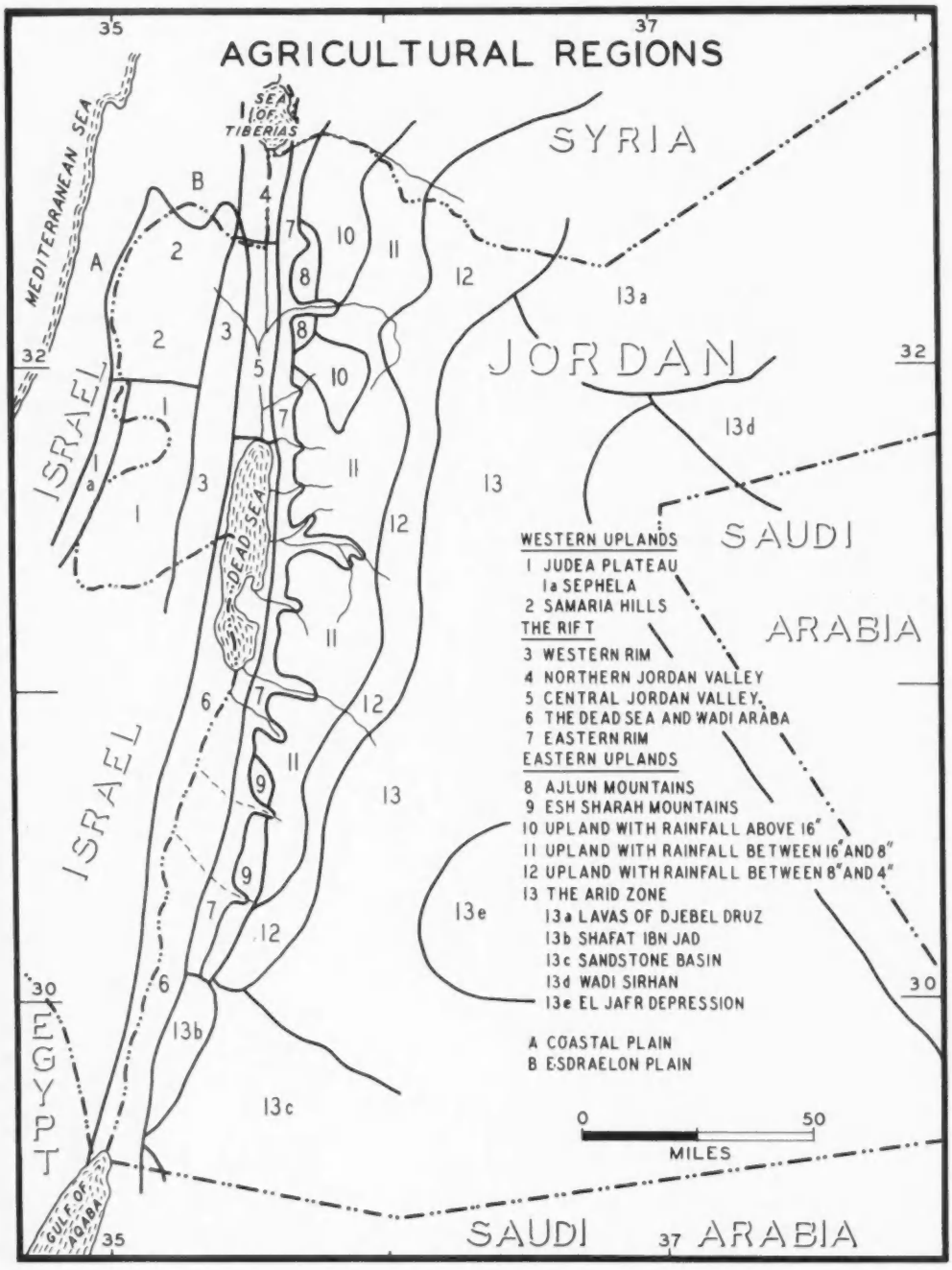

AGRICULTURAL REGIONS
35
37
32
30
MEDITERRANEAN SEA
SEA OF TIBERIAS
SYRIA
JORDAN
ISRAEL
DEAD SEA
SAUDI ARABIA
GULF OF AQABA
WESTERN UPLANDS
1 JUDEA PLATEAU
1a SEPHELA
2 SAMARIA HILLS
THE RIFT
3 WESTERN RIM
4 NORTHERN JORDAN VALLEY
5 CENTRAL JORDAN VALLEY.
6 THE DEAD SEA AND WADI ARABA
7 EASTERN RIM
EASTERN UPLANDS
8 AJLUN MOUNTAINS
9 ESH SHARAH MOUNTAINS
10 UPLAND WITH RAINFALL ABOVE 16"
11 UPLAND WITH RAINFALL BETWEEN 16" AND 8"
12 UPLAND WITH RAINFALL BETWEEN 8" AND 4"
13 THE ARID ZONE
13a LAVAS OF DJEBEL DRUZ
13b SHAFAT IBN JAD
13c SANDSTONE BASIN
13d WADI SIRHAN
13e EL JAFR DEPRESSION
A COASTAL PLAIN
B ESDRAELON PLAIN
0
50
MILES

FIG. 2

in the second, water for irrigation is potentially available; and the third one is essentially hopeless.

3. The Western Rim of the Rift. The western rim of the Rift is in a rain-shadow location and is dry. Differentiation can be made between the east slope of Samaria, which still has sufficient moisture for patches of cultivation and seasonal grazing, and the east slope of the Judea Plateau, which is a true desert well called the Wilderness with only a small amount of seasonal grazing. No other landscape equals the bareness of the marl slopes above Jericho. South of the Dead Sea the rim is less pronounced and the transition to the arid southern Negeb is a more gradual one, but that is outside Jordanian territory.

4. The Northern Part of the Jordan Valley. The northern section of the valley is relatively small, but it is important as it is classified as good quality land suitable for a wide range of crops and here irrigation is available for intensive farming. It is the only part of Jordania falling under that classification except for the already mentioned small area around Jenin. The problem of irrigation will be solved in the near future by the Yarmuk Dam which is now under construction. Precipitation is around 16 inches.

5. The Central Jordan Valley. The central valley is now practically worthless, a dry wasteland except for some irrigation on the river flood plain and small patches of irrigated land at the foot of the alluvial fans of the incoming valleys. What can be done is shown, for instance, at Jericho with its date palms and bananas. The Yarmuk project is intended to bring life into this desert. Since the Jordan itself cannot be used, because the state of Israel, which controls that river, is planning to use the water for a huge scheme of irrigation, the Yarmuk is the only river available for providing water for irrigation. The dam will be built at a narrow spot in the valley north of Irbid where rock and earth is available for construction.

These plans will make the central Jordan Valley a garden of production with winter fruit and vegetables for the European market, bananas, and probably cotton. Refugees, and there are plenty of them, will be settled on the irrigated lands. It is expected that about 100,000 refugees can be settled on the planned 200,000 irrigated acres. However, as long as there is a complete break between Jordania and Israel, the valley has no access to its logical outlet. Complete use of the water of the Jordan and the Yarmuk would mean the partial drying up of the Dead Sea (some water is brought in by springs) if it were not fed by sea water from the Mediterranean as suggested by Lowdermilk.[4]

6. The Dead Sea and the Wadi Araba. The shores of the Dead Sea, as far as Jordania is concerned, are deserted. The plant of the Jericho Potash Company was destroyed in the war, and the navy, consisting of a few small boats, is rotting in front of the landing place on the north bay of the Lisan peninsula. Only at an occasional spot is there a small oasis, usually at the outlet of a wadi. The Lisan peninsula has possibilities, but very little has been done. Bananas would do well here and there is some water, but at present there would be no market. The Wadi Araba is a desert. Once an important trade road as the magnificent ruins of Petra indicate, it is now used only by some Bedawin tribes, which cause trouble at times by raiding across the Israel boundary.

7. The Eastern Rim of the Rift.

[4] W. C. Lowdermilk: "Palestine: Land of Promise," New York and London, 1944, Chapter 11.

Except for the northern part, which faces the Esdraelon depression and gets a fair amount of precipitation, the whole rim of the Rift is dry, increasing in dryness southward. Generally the slope is steep and quite impressive seen from the Rift itself; only in the northern, better-watered part is the slope more gradual and less high, partly because the uplands are below 2000 feet and the bottom of the Jordan Valley is not as far beneath sea level as it is nearer the Dead Sea.

Except for the northern part, which is well cultivated, the rim has little or no value to man. Some sections are bare; other parts have a scant grass-scrub vegetation. Locally, the valleys which have been cut into the rim have been used for irrigation. Sometimes bands of fruit trees and crop fields extend on both sides of the stream; more often the cropped land consists of scattered patches, found where conditions are favorable. Their economic value decreases southward as the rainfall on the slope and the upland beyond decreases. The Yarmuk and the Zarqa, for instance, have cut down far into the uplands and carry a considerable supply of water, especially the Yarmuk which receives water as far back as the Djebel Druz. Southward, these rivers become less important, but the Wadi Karak, for instance, which the author followed on a trip to the Dead Sea, still has many small patches of cultivated land wherever the valley bottom is wide enough or terraces are available for irrigation.

The Eastern Uplands

Subdivisions of the Eastern Uplands are based on climate and relief. The lines of 16, 8, and 4 inches of precipitation, already referred to, have been used as limits of agricultural regions. However, two special divisions have been recognized because of their marked elevation and relief, namely the Ajlun Mountains north of the line Amman-Jericho and the Esh Shara Mountains in the south near Shaubak.

8. The Ajlun Mountains. Rising well above the general level of the plateau, reaching above 4000 feet, and cut into two parts by the Zarqa River, the Ajlun Mountains carry the last important remnants of the forests which once covered the wetter parts of the Eastern Uplands. Open forests of oaks (Kermes and Vallonea), pines (Aleppo and Stone Pine), cypresses, and acacias, interrupted by crop fields, make this a most delightful landscape, especially in spring when the ground is covered by flowers.

Reforestation is taken quite seriously in Jordania, and Australian experts, used to similar conditions, are hard at work planting eucalypts and acacias. Many of the wadis are terraced and small trees have been planted. Most of them seem to have died, but some will live and form the foundation of a new forest which might cover many of the presently bare slopes.

9. The Esh Sharah Mountains. North of Shaubak the rim rises to almost 6000 feet, and even seen from the east the impression is one of a mountain range which is rather narrow in extension and dissected by deep valleys having their outlet at the Wadi Araba. This area is known as the Esh Sharah Mountains. Heavier precipitation (outliers of the area with more than 16 inches) resulted in forests of which few remnants are left. The demand for wood during the construction of the Mecca Railroad almost finished what was left and the now disused branch of the main railroad which led to Shaubak is mute evidence of the deforestation. In summer, desert tribes use part of the region for the grazing of their flocks. Some of the wider upper parts

of the valleys leading westward are well cultivated and accordingly well populated. Shaubak is one of the centers, as is Wadi Musa which leads to Petra.

10. The Northern Section of the Upland with more than 16 inches Precipitation. The 16 inch line extends a tongue southward from the Syrian border for about 60 miles, crossing the main road between Amman and Jericho and almost reaching to Mount Nebo from which Moses saw the promised land. This tongue also includes the Ajlun Mountains which have been discussed separately. The northern part, a slightly rolling upland, is the best agricultural section of Jordania, with well cultivated fields and numerous fruit trees. Irbid is the market center and reflects the productivity of the area. Farther south the zone is more dissected, but the basin-shaped depressions and the broad valleys (broad in contrast, at least, to the deep gorge of the Zarqa which drains most of the area) show good farming and villages that are hidden under fruit trees and surrounded by vegetable gardens.

11. The Zone Between 16 and 8 Inches in Precipitation. The zone of 16 to 8 inches of precipitation has two parts, one to the east of the northern mountains and western uplands where the rainfall gradually drops, and a long tongue extending all the way south along the rim up to Wadi Musa. In spite of the risk of dry years, some parts near to the 16 inch line are productive, especially the plain between Amman and Madaba, one of the few areas of large holdings. Some favorable spots where water is available, often in the form of a large spring, are especially attractive. Examples are Karak and especially Tafila, located on the broad amphitheater which narrows westward into the gorge of the Wadi of that name.

12. The Zone Between 8 and 4 Inches in Precipitation. East and south of the preceding zone is a rather narrow strip of land, the transition between the uplands with higher precipitation and the arid zone to the east and south. Evidence of fields which had been cultivated show that in wet years crops can be raised, but those spots are generally well selected, in depressions where ground water is close to the surface, and most of the region is a steppe covered with sage brush.

13. The Arid Zone. Except for extensive grazing, chiefly in winter time, this large area which extends into Iraq and Saudi Arabia is not of much economic value. Oases are few in number. Ma'an is the largest one and even that is not very impressive. The northern part of the zone is hilly, with rocky ridges separating mud pans. The southern part is, in spots, very flat and monotonous. Along the rim of this volcanic massif of which the center, the Djebel Druz (13a) is located in Syria, springs occur. The most important, at El Azraq, forms a lake covered with reeds, a paradise for birds. There are two depressions, one, El Jafr (13e), east of Ma'an, and the other, Wadi Sirhan (13d), extending from Azraq into Saudi Arabia. In times of rainfall both the wadis bring large quantities of water which makes them temporarily better grazing areas. The Granite Mountains (Shafat Ibn Jad 13b) in the south and the sandstone basins (13c) are almost deserted.

NATURAL RESOURCES

Resources other than soil are meager and those that are present are largely unused. There is no coal, no oil except for some seepage along the Rift, and the water power is only slightly used. The Yarmuk dam, if completed, may change that picture as far as water power is concerned. The salt resources

of the Dead Sea lay untouched as far as Jordania is concerned. Large available deposits of phosphates wait for better means of transportation. Industrial development has not gone much beyond the workshop stage. The lists of imports include besides sugar, rice, and coffee, mainly manufactured products, such as cotton goods, cement, and motor cars, with a total figure five times as high as that of the meager agricultural exports. Still Jordania is part of the oil story of the Middle East as it is crossed by two pipelines, the one from Kirkut to Haifa (now discontinued beyond the Israeli boundary) and the one from Dahran (Saudi Arabia) to Sidon in Syria.

TOURISM

The most neglected but probably the most promising source of income is tourism, not based on the natural beauty of the country, although certain parts are most attractive especially during the spring flower season, but on its place in history.

In Jordania are the most important parts of the Holy Land with the old cities of Jerusalem, Bethlehem, and Samaria (Nablus), and this alone could attract thousands of visitors if the boundary problems between Israel and Jordania were solved and the crossing of the now existing barrier were permitted. Impressive also are the ruins of the Roman period. Jerash, for instance, north of Amman, ranks high among the visible evidences of Roman culture. The Crusaders put their stamp upon this area and massive castles indicate the value the Crusaders gave to Transjordania (Oultre Jourdain as they called it) as a defense of the Kingdom of Jerusalem. Most beautiful, in some ways unique, are the ruins of Petra, once a commercial metropolis on the road from the Gulf of Aqaba northwards, now with its temple and tombs carved out of rose-colored sandstone, a cross section through history from the centuries before Christ up to the time of the Crusades.

In order to attract tourists, hotels have to be provided, not to speak of better roads. Hotels which can be called modern are found in Amman, Jerusalem, and Ramallah, a vacation center ten miles north of Jerusalem, but all of them are small and unable to handle the present day demands at the time of the peak, namely Christmas. Jerusalem needs a large modern hotel; there is one, but it is on the other side of the boundary. A well organized chamber of tourism could do wonders in selling the religious historical attraction to the rest of the world. At present travelling outside of the few main roads is difficult and expensive. A trip to Petra, for instance, took two days of bumpy driving and two nights in a tent, which in my case was made available to me by a Government office. The hotel at Ma'an, terminal of the railroad, was too dirty for words. Here is a source of income which is still practically untapped.

POPULATION

The distribution of population follows the pattern of rainfall (Fig. 3). Of the total population of 1.329 million in 1952 (which includes the refugees which have been only partly absorbed) more than half live west of the Jordan on the well-watered uplands of Judea and Samaria. East of the Jordan the density decreases rapidly southward and the land south of the Wadi Mojib (the districts Karak and Ma'an) has a population of only about 85,000. The dots on the map, each one representing 10,000 people, have been placed as well as possible, but in sections of very few

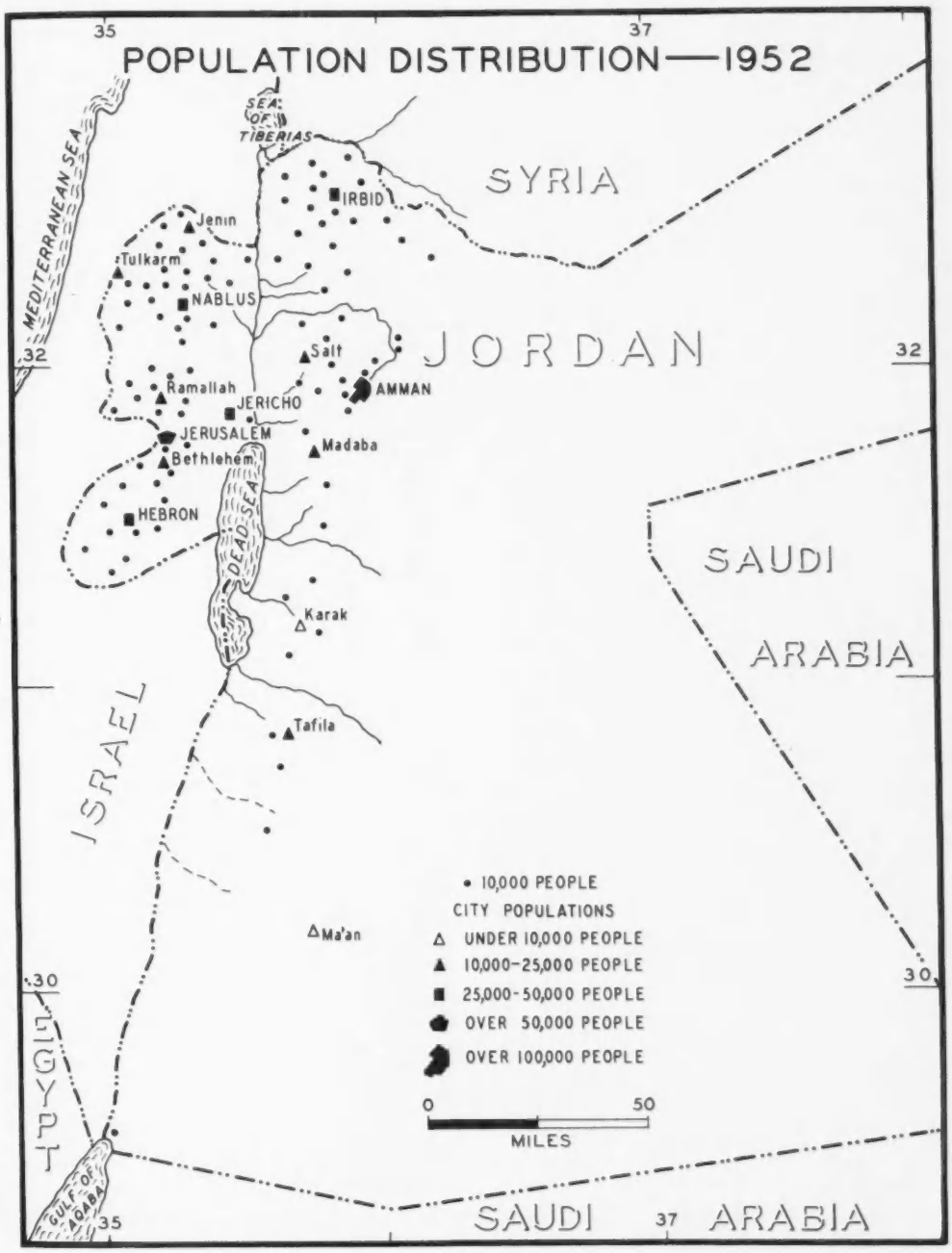

POPULATION DISTRIBUTION—1952
35
37
SEA OF TIBERIAS
MEDITERRANEAN SEA
SYRIA
IRBID
Jenin
Tulkarm
NABLUS
JORDAN
32
Salt
AMMAN
Ramallah
JERICHO
JERUSALEM
Bethlehem
Madaba
HEBRON
DEAD SEA
SAUDI
ARABIA
Karak
ISRAEL
Tafila
Ma'an
• 10,000 PEOPLE
CITY POPULATIONS
△ UNDER 10,000 PEOPLE
▲ 10,000-25,000 PEOPLE
■ 25,000-50,000 PEOPLE
⬟ OVER 50,000 PEOPLE
OVER 100,000 PEOPLE
0
50
MILES
30
EGYPT
GULF OF AQABA
SAUDI ARABIA

FIG. 3

people such a dot covers a lot of territory.

There are only two cities of size: Amman, the capital; and Jerusalem. The old walled city of Jerusalem had in 1952 an official population of 46,000, but the district, which includes the suburbs, had 85,000. Amman has had a remarkable growth since Jordania was founded, from practically nothing to a teeming city of more than 100,000. The Amman subdistrict has almost 200,000. The commercial core is in the valley branches of the Wadi Zarqa and the residential quarters gradually fill the adjacent upland with steep slopes connecting the two.

The other, much smaller, cities are commercial centers in rural districts such as Hebron in southern Judea, Nablus in Samaria, Salt west of Amman, and Irbid in the northeastern uplands.

In spite of the predominantly Moslem character of the state there are many Arab Christians who play an important part in the economic development. Ramallah, for instance, north of Jerusalem, is a Christian settlement, and in its economic activities makes a more prosperous impression than most of the Moslem towns.

TRANSPORTATION

Jordania possesses only one railroad, part of the once famous Mecca line constructed by the Turks in the years before the first World War (Fig. 4). It follows the ancient trade road and frontier against desert raids, where easy travelling was possible, not disturbed by the deep ravines which dissect the eastern rim of the Jordan Rift. Coming from Damascus the line enters Jordan north of Mafraq, important road junction and air base, continues to Amman the capital, and then extends southward to Ma'an the terminal. The continuation toward Saudi Arabia has not been used since the first World War. From Ma'an a side branch extends to Ras en Naqb where it connects with the hard-surface road from Aqaba. Freight is transferred there from railroad car to truck or vice versa. Construction of a railroad from that point to the harbor of Aqaba, which would greatly simplify the flow of freight, has often been discussed. However, Ras en Naqb is located at an elevation of 5300 feet, and to the south the limestone escarpment, mentioned before, drops 2000 feet while the outlet of the sandstone basin to Aqaba (Wadi el Yutm) is often blocked by rockslides which occur after rare but heavy rainstorms.

The road pattern is a simple one and reflects the dual character of the state; there is only one trunk road connecting east and west, the one between Amman and Jerusalem which crosses the Jordan near Jericho by way of the Allenby bridge. From Jerusalem hard surface roads lead north to Jenin and Tulkarm by way of Nablus and south to Hebron. However, the regular road between Jerusalem and Bethlehem is cut by Israel, and a new road had to be constructed by-passing the Israel boundary. Amman is the junction of a double north-south road system. One follows the inner side of the uplands, parallel to the railroad; the section Mafraq-Amman is an excellent hard surface road, but the one between Amman and Ma'an is only a desert track, passable but bumpy. The other crosses the upland and the deeply eroded valleys. The northern part (Amman to Irbid) is for the greater part surfaced; the southern part is surfaced between Amman and Karak except for the crossing of the Wadi Mujib; the continuation is still in rather bad condition but is important as it is the only connection with such upland settlements as Tafila and Shaubak. Tracks

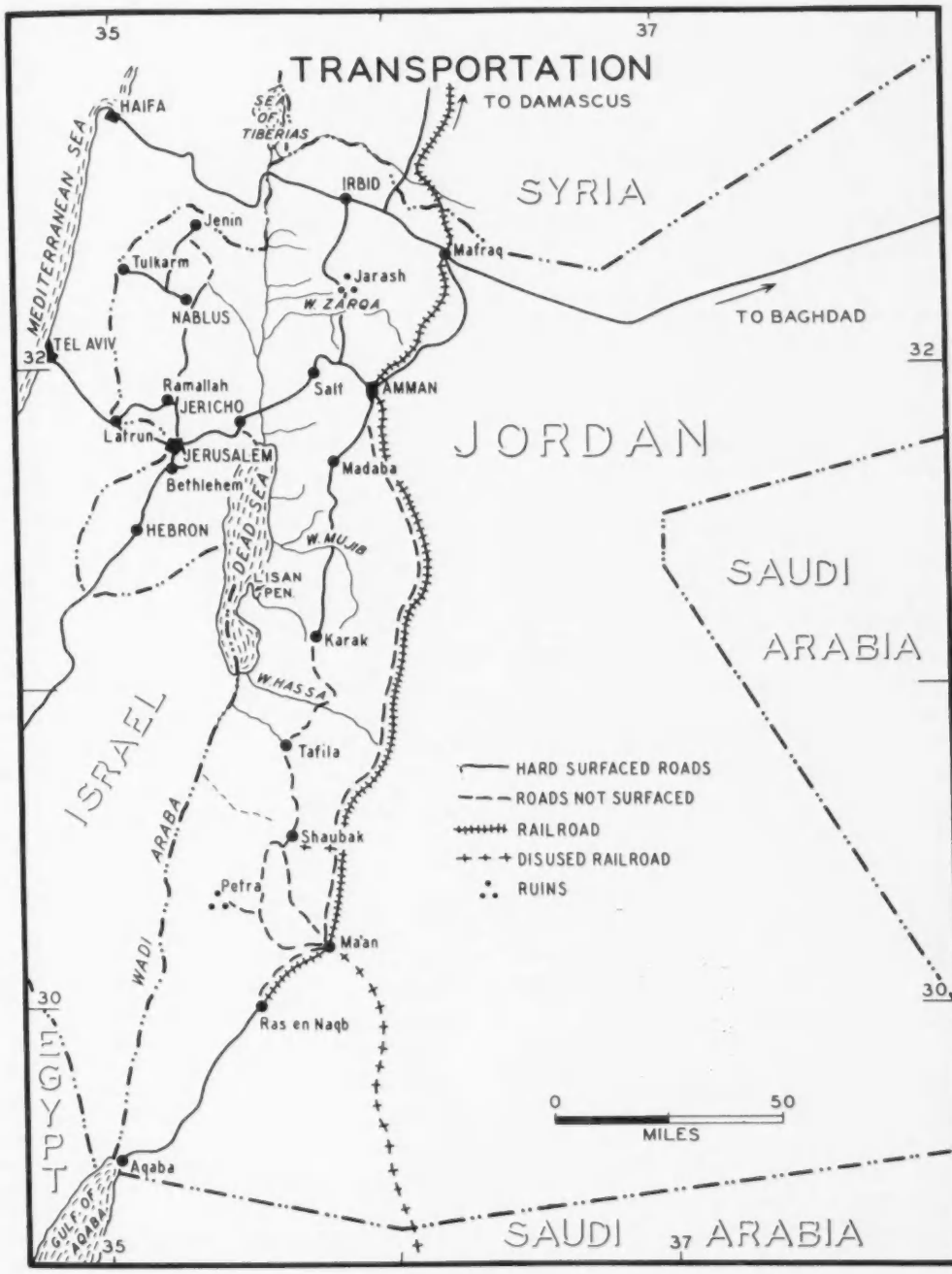

TRANSPORTATION
35
37
HAIFA
SEA OF TIBERIAS
TO DAMASCUS
MEDITERRANEAN SEA
IRBID
SYRIA
Jenin
Mafraq
Tulkarm
Jarash
W. ZARQA
NABLUS
TO BAGHDAD
32
TEL AVIV
Ramallah
Salt
AMMAN
JERICHO
JORDAN
Latrun
JERUSALEM
Madaba
Bethlehem
DEAD SEA
HEBRON
W. MUJIB
SAUDI
ARABIA
LISAN PEN.
Karak
W. HASSA
ISRAEL
Tafila
HARD SURFACED ROADS
ROADS NOT SURFACED
RAILROAD
DISUSED RAILROAD
RUINS
Shaubak
ARABA
Petra
Ma'an
WADI
30
Ras en Naqb
0
50
MILES
EGYPT
Aqaba
GULF OF AQABA
SAUDI ARABIA
35
37

FIG. 4

connect the western road with the one to the east and with the railroad.

At Mafraq the highway from Haifa to Baghdad crosses the desert road. This highway is now truncated because of the political break between Israel and Jordania but still serves as the best road between Amman and Baghdad and even between Damascus and Baghdad, as the direct connection between those two is only a desert track and the surfaced trunk road is faster. Jerusalem and Amman have rather small airfields but improvements are planned. Large planes can use the British Mafraq air base—the BOAC line Baghdad-London stops there—whereas the airfield of Aqaba chiefly has military importance as it serves the British garrison which occupies that town at the junction of Egypt, Israel, Saudi Arabia, and, of course, Jordania.

THE PORT OF AQABA

Geographically, Haifa is the natural outlet for most of Jordania, but politically that outlet is closed. Road and rail connections with Beirut by way of Damascus are available, but traffic has to deal with two foreign states, Syria and the Lebanon. This puts the major emphasis on Aqaba in spite of its eccentric location on an inland sea, closed from the Mediterranean by the Suez Canal with its high tolls.

Aqaba as a port is still very primitive: the few ships which come cannot reach the shore and tenders have to be used. Plans to improve conditions were accepted in 1952, and probably the loading and unloading will be facilitated by long jetties extending to deep water.

CONCLUSION

What are the conclusions which can be reached? Undoubtedly improvements will be made, partly due to many foreign experts who are now working in the country. Those improvements will be chiefly in the field of agriculture, including irrigation, transportation, and tourism. But there are decided limitations to that progress. Climatic conditions which will always restrict the amount of arable land. The burden of a modern government will rest heavy on a country which has little income. Perhaps its major assets are the people themselves—frugal, hard workers, with a sense of dignity and courtesy not yet destroyed by contacts with what we call our modern world. Jordania is not yet even a real state; most of its people call themselves Arabs and not Jordanians; the process of nationalism (and here the word is not used in its unfavorable sense) is slow. Perhaps the state's future lies in its becoming part of a greater Arab union which will unite the Arab world while leaving autonomy to its individual units. These questions cannot be answered yet, but meanwhile Jordania tries to do the best it can with meager assets; in fact it is doing remarkably well with remarkably little.

GREAT LAKES—OVERSEAS AN EXPANDING TRADE ROUTE

Harold M. Mayer

Dr. Mayer, formerly in planning work and now on the staff of the Department of Geography, University of Chicago, recently served as a member of the Chicago Regional Port District Board.

THE St. Lawrence seaway route between the Great Lakes and Europe has been actively used by shipping for many years. The Seaway project will not result in the creation of a new route for water-borne traffic, but rather will result in the enlargement of an existing one.

Canada has developed, over a period of more than 150 years, a system of canals to circumvent the rapids of the St. Lawrence River and thereby make possible direct non-break-bulk communication between the Great Lakes and the Atlantic Ocean. The restricted dimensions of these canals and their locks have been the principal impediments to large-scale development of a direct Great Lakes-to-Europe trade by through vessels. It is the limitations imposed by these locks which prevent access to the Great Lakes by standard-sized ocean freighters. These locks, likewise, together with the connecting channels between them, prevent the large bulk freighters of the Great Lakes from access to oceanic trades during the closed season for lake navigation.

In spite of these limitations, vessels have for many decades regularly passed from the Great Lakes to the sea. A type of vessel, known as a "canaller," has been developed especially for passage through the restrictive locks (Fig. 1). Such ships engage in trade on the Great Lakes during the open season of navigation. When the connecting passages between the lakes are closed by ice, generally between December and early April, many of the "canallers" are engaged in coastwise trade in the Atlantic. During the spring, summer, and autumn seasons of open lake navigation, most of them ply between the Great Lakes and ports of the lower St. Lawrence River. The "canallers" are engaged in a variety of trades, among the most important of which are the transportation of woodpulp and newsprint from Canadian ports to the consuming centers on the Great Lakes, such as Chicago. They are also engaged in the package freight trades between Montreal and upper lakes ports of Canada, and in the transportation of grain from the upper lakes to Montreal for transshipment there en route to Europe. These vessels are nearly all identical in appearance, except for a few more or less distinctive tankers, and are practically identical in dimensions. The typical "canaller" is 254 feet in length, 43.6 feet in beam, and with a loaded draft of 14 feet. With these dimensions, the vessels can pass through the St. Lawrence locks, such

FIG. 1. S.S. *Kingdoc* in the upper St. Lawrence River. This vessel is a typical "canaller" engaged in Great Lakes–St. Lawrence River trades.

as the Lachine Lock at Montreal (Fig. 3). Until the enlargement in 1932 of the Welland Canal to the dimensions adopted as standard for the proposed enlargement of the St. Lawrence Seaway, the "canallers" were the only type of lake freighter which could enter Lake Ontario from the other Great Lakes. Now the standard large lake freighters regularly pass through the Welland Canal and across Lake Ontario as far east as Ogdensburg, New York, and Prescott, Ontario. East of those points, the restrictive dimensions of the St. Lawrence canals and locks prevent passage of the standard larger types of lake vessels.

For the past two decades, the Great Lakes have been connected directly with overseas ports by an increasing number of regular liner shipping services. No longer is it necessary for the industries of the Middle-Western United States or central Canada to ship overland or by small "canaller" type vessel to St. Lawrence or Atlantic seaboard ports, and there transship, in order to secure transatlantic liner service.

While the direct trade between the Great Lakes and overseas is still very small in comparison with the tremendous tonnages of bulk cargoes handled each season on the Great Lakes and in comparison with the overseas trade of the larger ports accessible by deep-draft ocean vessel, such as New York and Montreal, it is growing steadily in importance. Because it is largely made up of high-class package freight, machinery, and other goods which take a high freight rate in proportion to their weight or bulk, the trade is much more important than the tonnage statistics indicate. An examination of the growth, present status, and future prospects of the direct steamship trade and services between the Great Lakes and overseas is, therefore, called for.

HISTORY OF GREAT LAKES—OVERSEAS SHIPPING

Although liner service on regular schedule between the Great Lakes and overseas ports is a development of the past two decades, direct shipping movements without break of bulk between the lakes and overseas is not a recent development.

During the latter half of the last century a few sailing vessels entered the Great Lakes from the Atlantic through the St. Lawrence canal system. Occasional cargoes of grain from Duluth, Fort William, Milwaukee, and Chicago reached European ports directly.

World War I stimulated the growth of direct trade between the Great Lakes and Europe. Shipyards on the lakes turned out small combat vessels, both for the United States and Canadian navies and for foreign governments. Such craft were moved to salt water through the St. Lawrence route. Great Lakes shipyards also produced a number of merchant vessels for ocean service, small enough to pass through the locks. Some were operated in coastwise and overseas trades until very recently. A few were used in package freight service on the lakes between the two World Wars, after being returned from salt water. The latter, in the package freight service of the Canada-Atlantic and the Minnesota-Atlantic lines between upper and lower lakes ports, disappeared from the Great Lakes with the termination of package freight service just prior to World War II.

Meanwhile, the diversion during World War I of many of the "canaller" type vessels to ocean service resulted in a subsequent shortage on the Great Lakes of vessels small enough to operate through the canals and locks to the St. Lawrence system. This deficiency was in part overcome by the use of small Scandinavian tramp steamers, which came into the lakes from overseas each Spring, generally bringing cargoes of *Spiegeleisen* or other specialized commodities, and returning overseas in late Fall, after a summer of plying between United States and Canadian lake ports. Because of the coasting laws, it was not possible for them to engage in commerce between United States ports or between Canadian ports. Some of the vessels were, for several seasons, chartered by a Canadian operator for regular service between Toronto and Newfoundland.

Meanwhile, direct trade between the Great Lakes and salt water ports was increasing. Each season saw larger numbers of foreign tramps entering the

FIG. 2 (left). The Soulanges Canal, one of the waterways circumventing the rapids of the St. Lawrence, showing a typical "canaller" type of vessel, and the restricted dimensions of the locks.

FIG. 3 (right). Lachine Lock, Montreal, the head of deep-draft navigation on the St. Lawrence, showing the correspondence between dimensions of locks and vessels.

lakes. It became evident that regular scheduled liner service by specially designed vessels capable of economical operation on the lakes and the St. Lawrence canal system as well as on the Atlantic Ocean might command a market. The feasibility of this type of operation was demonstrated in the early 1930's by the maintenance for several seasons of a regular steamship service between New York and Chicago through the St. Lawrence. The "lakers" built during World War I were employed, but the competition, both of the railroads and of the shorter New York State Barge Canal route, made continuation of the service economically impossible.

GROWTH OF LINER SERVICE

The first scheduled service between Great Lakes and overseas ports was begun in 1933. Except for an interruption during World War II, each year between 1933 and the present has seen an increasing number of vessels and sailings (Fig. 4). In 1952, there were 123 round trips made directly between the Great Lakes and Europe by regularly scheduled liners, in addition to 22 voyages by tramp ships.

Scheduled service was begun by a Norwegian company in 1933, on an experimental basis, and was continued until World War II caused diversion of the vessels into other services. Following its resumption in 1945, the Great Lakes-to-Europe trade has attracted additional new vessels each year.

The pioneer company in the trade was the Norwegian firm of Olson & Ugelstad, Inc., who, under the trade name of Fjell Line, continue to be the largest single operator of vessels between the Great Lakes and Europe. The company began service to the Great Lakes by chartering its vessels for a seasonal operation between Toronto and Newfoundland. Early in 1933 it commenced direct service between the Great Lakes and Europe with "canaller" type vessels, and immediately began to plan for new ships especially designed for the trade. Before its interruption by the war, the Fjell Line had a number of the new specially-built ships in regular transatlantic service between Chicago, Milwaukee, Detroit, Cleveland, Toronto, and other Great Lakes ports on the one hand and ports in Scandinavia, the United Kingdom, the Netherlands, and Belgium on the other. Two distinct services were operated, then as now, some sailings calling only at Scandinavian ports in Europe and others calling at Channel ports.

The early success of the Fjell Line encouraged a Dutch company, the Oranje Line, to enter the Great Lakes-to-Europe trade, starting in 1938. It also diverted its vessels to war service, and the route into the lakes was not served by liners again until 1945, with a single sailing by a Fjell Line vessel. The Oranje Line did not resume until 1946.

Since World War II the liner services between the Great Lakes and Europe have expanded rapidly in number of ships, number of annual sailings, and number of companies engaged in the trade (Table I).

In 1946 the Swedish American Line, long an important transatlantic carrier, extended its service into the Great Lakes, employing modern, specially-designed motorships. Because of its direct service between the Great Lakes and Europe, the line has been able to capture a portion of the midwestern trade which it could not have obtained for its larger vessels operating from Atlantic seaboard ports of the United States and Canada. For several seasons, the Swedish American Line operated a service to the West Indies from Great Lakes ports as far west

TABLE I

NUMBER OF VESSELS AND NUMBER OF TRIPS BETWEEN THE GREAT LAKES AND EUROPE, 1945–1952, WEST OF THE WELLAND CANAL

Line and Nationality	*1945*		*1946*		*1947*		*1948*		*1949*		*1950*		*1951*		*1952*	
	*T**	*V**	*T**	*V**	*T**	*V**	*T**	*V**	*T**	*V**	*T**	*V**	*T**	*V**	*T**	*V**
Fjell Line (Norwegian)	1	1	#	7	17	6	19	8	25	8	32	12	26	9	26	8
Oranje Line (Dutch)	..	..	#	3	10	5	14	5	20	6	18	6	23	7	22	7
Swedish American Line (Swedish)	..	..	#	2	6	2	15	7	13	6	14	6	13	5	19	6
Swedish Chicago Line (Swedish)	..	..	..	..	4	2	8	3	7	3	11	5	7	3	14	5
Hamburg Chicago Line (German)	..	..	..	..	..	..	..	..	..	..	..	..	15	7	19	7
Fabre Line (French, operating Norwegian vessels)	..	..	..	..	..	..	..	..	..	..	..	..	4	2	21	8
Manchester Liners, Ltd. (British)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2
Total, liners	1	1	#	12	37	15	56	23	65	23	75	29	88	33	123	43
Tramps	#	#	#	#	#	#	3	2	8	5	20	15	12	7	22	17
Total	#	#	#	#	#	#	59	25	73	28	95	44	100	40	145	60

*T = Round trips; V = Vessels.
#Not available.
Source: Lake Carriers' Association, *Annual Report*, 1945–1952.

as Detroit, but the service was discontinued and the ships transferred to the Great Lakes–Europe route. In 1947 a second Swedish company, the Swedish Chicago Line, also with new specially-designed motorships, entered the trade between the United States and northwestern Europe.

Between 1947 and 1950 the competitive situation on the route was stabilized, with four companies operating regular services between Great Lakes ports and northwestern Europe. During that period, the number of sailings increased each year.

The demand for space between the Great Lakes and Europe increased rapidly with the impetus of the foreign aid programs and with the increased productivity of the United States, and especially the Middle West, following World War II. Canada, furthermore, imported an increasing quantity of raw materials and exported its products to ever-widening foreign markets. Ships entering the Great Lakes from overseas usually carried the maximum loads permitted by the 14-foot draft limitations of the St. Lawrence canals and locks, and departed for Europe with comparable full loads. The liner sailings were insufficient to meet the demand, in spite of the increasing frequency of service. A number of tramp vessels made voyages into the Great Lakes to supplement the services of the four regular lines.

The shipping services between the Great Lakes and overseas ports expanded in 1951 as the result of two important new developments. The first was the entrance of a company into the trade with new vessels flying the flag of the West German Republic. This was the Hamburg Chicago Line, whose vessels regularly sail between Great Lakes ports as far west as Chicago, and western European ports as far east as Hamburg. The second important development was the beginning of a direct service between the Great Lakes and the Mediterranean. This service is performed by the Fabre Line, a French company which for many years engaged in the transatlantic run between the east coast of the United States and Canada and the Mediterranean. In 1951 the service was extended

into the Great Lakes, with the use of two chartered Norwegian vessels, but by the following year the company introduced new ships especially designed for the Great Lakes–Mediterranean trade. They serve ports of southern Spain and France as well as North African ports, including Casablanca, Algiers, and Oran.

British vessels had occasionally entered the Great Lakes as tramps, but until June 1952 had not engaged in regular liner services between the lakes and Europe. Manchester Liners, Ltd., a subsidiary of Furness, Withy and Company, one of the largest British ship operators, had for many years operated a service between Montreal and Manchester, using large ocean steamers. The service was extended westward into the Great Lakes early in the 1952 season, with the delivery of two specially-designed vessels, built to the maximum dimensions admissible by the St. Lawrence locks. The service was confined in 1952 to Canadian lake ports, especially Toronto and Hamilton.

Two important events in the expansion of Great Lakes–overseas scheduled services occurred early in 1953: the inauguration of operations by the first American shipping company in the trade, and the beginning of scheduled service via the St. Lawrence route between the Great Lakes and the Caribbean area.

In May, 1953, the Metron Line, with home offices in Chicago, began scheduled operations between Chicago and Antwerp, using two of its own and two chartered vessels, all under the Norwegian flag. During 1953 sailings were planned about 21 days apart. Unlike other lines, the Metron Line emphasizes the traffic at the terminal ports, only infrequently calling at other ports en route. Thereby, the schedules between Chicago and Europe are somewhat

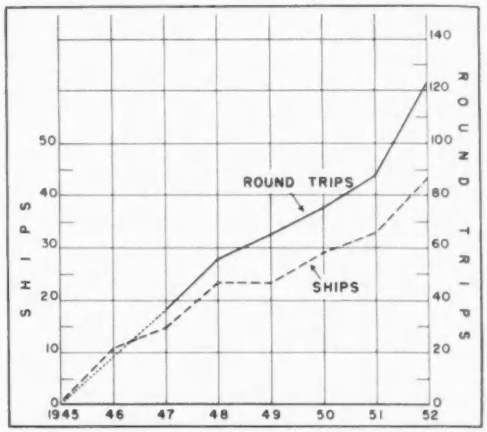


FIG. 4. Graph showing number of ships and round trips in Great Lakes–Overseas Direct Scheduled Service, 1945–1952. The steady and rapid annual increase in volume of service since World War II is continuing into 1953.

faster than those of the competing lines which involve calls at intermediate ports. The principal westbound traffic of the Metron Line consists of steel shapes manufactured in Belgium and distributed throughout the middle-western United States by a subsidiary company affiliated with the shipping line. General cargo is carried eastbound.

Although the Swedish American Line had previously scheduled infrequent service to the Caribbean from Great Lakes ports as far west as Detroit, the first regularly scheduled service between the lakes and Middle America was begun in June 1953 by the Ahlmann Transcaribbean Line, using German-flag vessels. Sailings were scheduled monthly in 1953, connecting Chicago and other lake ports with the Venezuelan ports of La Guaira, Puerto Cabello, and Maracaibo, as well as other ports in Venezuela and Columbia as cargo is offered. Unlike most of the other Great Lakes–overseas vessels, those of the Transcaribbean Line regularly carry a small number of passengers to and from the lakes.

Two other companies announced plans to begin direct Great Lakes–overseas

service later in 1953. One of them, the Canuk Line, serves United Kingdom ports, connecting them with ports on Lakes Erie and Ontario with vessels under the British flag; the other, the F. A. R. M. Line, a French company, serves northern Europe.

Thus, with four new lines established, 1953 was the year of most rapid expansion of Great Lakes–overseas direct services.

PHYSICAL CHARACTERISTICS OF THE ROUTE

The Great Lakes–overseas route has certain physical characteristics which affect its economic utilization. These characteristics are: distances, channels and restrictive locks, and seasonal closing by ice.

The St. Lawrence route between Great Lakes and European ports is, of course, longer than the water route between Atlantic coastal ports on the two sides of the ocean. Because of the fact, however, that it is a northern route, and because the direction of the St. Lawrence River rather closely approximates the great circle route between the major cities of the Great Lakes area and the principal ports of northwestern Europe, the distances are not as great as might be supposed. From many Great Lakes ports the total mileage by the all-water route is considerably less than by rail to the Atlantic seaboard ports and thence by water. From New York to Antwerp, for example, is 3917 statute miles. From Chicago to New York the most direct rail route, via the Pennsylvania Railroad, is 908 miles, or a total distance from Chicago to Antwerp via New York of 4825 miles. From Chicago to Antwerp direct via the St. Lawrence all-water route the distance is 5014 statute miles, or only 189 miles longer than the rail-water route via New York. A considerable part of this difference is accounted for by the long voyage on Lakes Huron and Michigan circumventing the southern peninsula of Michigan. Ports east of Lake Huron have a considerable advantage: from Cleveland to Antwerp via the New York Central Railroad to New York and thence by sea is 4537 statute miles, as compared with 4367 for the all-water St. Lawrence route, a distance in favor of the all-water route of 170 statute miles. For comparability, these distances are taken along the summer track for steamships from New York, and via the Cabot Strait route, south of Newfoundland, from the St. Lawrence into the Atlantic. During late summer the Strait of Belle Isle, north of Newfoundland, is sufficiently free from ice to permit safe navigation, and vessels using that route save an additional 125 statute miles.

The circuitous route around Michigan places ports on Lakes Superior and Michigan, especially the latter, at somewhat of a disadvantage in distance as compared with rail-water routes. Several vessels each season enter the Great Lakes to serve ports on Lakes Ontario and Erie, without proceeding farther west. The distance disadvantage of the Lake Michigan ports, however, is relatively insignificant, because once a cargo is loaded aboard a vessel the small additional distance is unimportant as compared with the more favorable rates for the all-water route due to elimination of transshipment costs.

The dimensions of the existing channels in the St. Lawrence River, and especially the canals and locks which circumvent the various rapids in the river west of Montreal, constitute the bottlenecks which restrict the size of the vessels which can serve the Great Lakes–overseas route. The improvement of those channels and locks constitutes the proposed navigation

features of the St. Lawrence Seaway project.

The restrictive dimensions exist in six canals, constructed by the Canadian government. These canals have 22 locks the dimensions of which restrict vessels to a draft of 14 feet, a length of 255 feet, and a beam of slightly over 42 feet.

Total distance from the western end of the St. Lawrence canal system at the west entrance to the Galops Canal, to the east end of the system at Montreal is 112 miles, of which 47 miles consist of canals and 65 miles of river and lake channels (Table II).

The Rapide Plat and Farran Point Rapids are run by downbound vessels, except in times of unusually low water, thereby eliminating three lockages and five miles of navigation in restricted canals.

Mechanically, several of the locks are rather primitive, and the time of passage would be reduced by modernization, with or without enlargement. Delays are frequently encountered in waiting for clearance through the locks, for only one vessel can be handled at a time (Fig. 2). Time of passage through the entire St. Lawrence canal system and connecting river and lake channels is normally about 27 hours. From Lake Ontario to Montreal the normal elapsed time is about 33 hours.

The seven locks of the Welland Canal, connecting lakes Erie and Ontario, are much less restrictive. They were built to the dimensions proposed for the enlarged St. Lawrence locks, and they admit the largest lake vessels. Since some of the Welland Canal locks are built in parallel pairs permitting two-way movement, little delay is encountered awaiting clearance through them.

Connecting passages between the upper Great Lakes—the Detroit and St. Clair River channels, the Straits of Mackinac, the St. Mary's River and the Sault Ste. Marie canals—do not restrict the size or loading of transatlantic ships which now enter the Great Lakes, for they are designed to accommodate the much larger Great Lakes bulk freighters. Should the St. Lawrence Seaway be enlarged, however, considerable enlargement of the channels between Lake Erie and Lake Huron, and some enlargement of the St. Mary's River channels, with deepening, would be required.

Harbors on the Great Lakes, too, are more than adequate to accommodate

TABLE II

THE ST. LAWRENCE CANAL SYSTEM, PRESCOTT TO MONTREAL

	No. of Locks	*Normal Draft*	*Miles of*	
			Canal	*Lake or River*
1. Galops Canal	3	14'0"	7.36	....
St. Lawrence River	..	.....	.....	4.0
2. Rapide Plat Canal	2	14'0"	3.89	....
St. Lawrence River	..	.....	.....	9.5
3. Farran Point Canal	1	16'0"	1.28	....
St. Lawrence River	..	.....	.....	4.7
4. Cornwall Canal	6	14'0"	11.00	....
St. Lawrence River and Lake St. Francis	..	.....	.....	31.0
5. Soulanges Canal	5	14'0"	14.67	....
St. Lawrence River and Lake St. Louis	..	.....	.....	16.0
6. Lachine Canal	5	14'0"	8.74	....
Total	22	14'0"	46.94	65.2

Source: *The Canals of Canada*, Ottawa, The Department of Transport, 1946.

vessels which now enter the Lakes from the Atlantic Ocean, although most of them would need to be deepened if the Seaway project is carried out.

The seasonal closing of the connecting channels between the Great Lakes, and of the St. Lawrence River and canal system by ice conditions precludes all-year use of the all-water route between the Great Lakes and overseas.

The average season during which ocean-going vessels can enter and leave the Great Lakes is approximately eight months. The available season at ports on the lakes is, of course, several days less because of the time occupied in reaching the lake ports at the opening of the navigation season and of leaving at the close. On the other hand, the earliest Spring voyages into the lakes can begin overseas about ten days before the opening of lake navigation, and the last voyages terminate overseas as late as two weeks after the close of the season on the lakes.

The lower St. Lawrence, below Montreal, opens to navigation generally in late April, usually with the aid of ice-breakers. The channel below Montreal is dredged to a low-water depth of 35 feet, which is sufficient to accommodate all except the very largest ocean liners, but early in the season difficulty may be encountered because of ice. Nevertheless, the traditional gold-headed cane, a trophy awarded to the first ocean-going ship to reach Montreal each season, was won several times by the small ships in the Great Lakes-overseas trade.

The Canadian canals above Montreal open as soon as ice conditions permit, generally late in April.

Navigation in the connecting channels of the Great Lakes and in the Canadian canal system, as well as on the St. Lawrence River, closes officially each year early in December. Chicago generally sees its last transatlantic sailing during the third week in November.

Because of the seasonal closing of the route, the number of turnarounds—round trip voyages—that can be made by a vessel in the trade between the upper Great Lakes and Europe averages only three per season. A few ships, entering the lakes very near the opening date and leaving during the last week of navigation, have been able to make four turnarounds in a season.

Employment of the vessels which were specially-designed for the Great Lakes–Europe route during the portion of the year when the route is closed was formerly a problem complicated by the small size of the ships, which handicapped them in competition with the larger vessels that are regularly employed on most of the world's ocean routes. Idleness during the off-season would, of course, so reduce the advantages of the Great Lakes service that it would become economically unfeasible.

Most of the vessels in the Great Lakes–Europe trade are suitable, both economically and physically, for use during the winter season on the so-called "short sea" trades of Europe. Many of them carry manufactures of northwestern Europe into the Mediterranean, returning with full cargoes of citrus fruits, olives, and other Mediterranean produce. In recent years a regular trade, for example, has developed between Britain and Israel, in which some of the ships are employed during the winter, taking British manufactured goods and returning with oranges and other fruits and produce. Others of the vessels carry bananas from West Africa and the islands in the Atlantic, to Europe.

Part of the Great Lakes-overseas fleet is, of course, taken out of active service each winter for drydocking,

inspection, and repairs, thereby somewhat reducing the problem of off-season employment.

A few of the vessels are utilized in trade on regular transatlantic routes, supplementing the fleets of the regular transatlantic cargo lines when economic conditions permit. The Swedish American Line uses its fleet of small Great Lakes vessels in winter to supplement the larger vessels of the company in transatlantic service from coastal ports of the United States and Canada. The Fjell Line, late in 1952, announced plans for a winter service, using its Great Lakes–Transatlantic fleet between Europe and the Canadian maritime provinces. The Hamburg Chicago Line uses some of its vessels in a similar winter service.

THE VESSELS

The ships which carry on the Great Lakes–overseas direct trade are specially built. Originally, the service was performed by modified "canallers" with machinery and funnels aft, but during the middle 1930's the Fjell Line, and later the other companies, introduced new ships which more closely resemble the conventional deep-water cargo liners, except for size (Fig. 5). Most of the ships now in the Great Lakes–overseas trades are new post-war vessels of modern design and construction. The majority are motorships. Except for some of the Hamburg Chicago Line ships which have machinery and funnels aft, all are of typical ocean freighter design, with machinery amidships, and with either flush-deck or "three island" arrangement. Most of the vessels have four holds. A few have only three hatches including one of unusually large dimensions for the handling of bulky machinery, tanks, and other large pieces of cargo.

The *Svanefjell* (Fig. 5), a typical pre-war type of vessel engaged in the Great Lakes–Transatlantic trade, is one of a class of several identical ships built in Scandinavian yards in 1935–37. It is equipped with single screw, driven by reciprocating steam engines. The vessel is 1371 gross tons, 748 net tons, and approximately 2600 deadweight tons. It, like other ships in the Great Lakes–overseas service, is built to the maximum clearance of the St. Lawrence locks, and therefore has a length of 251 feet, and a beam of 42.3 feet.[1] The service speed is 13 knots. In the midship structure, in addition to accommodations for the ship's personnel, there is, as in most Great Lakes–Transatlantic vessels, comfortable cabins for 12 passengers. The passengers are not solicited commercially for travel west of Montreal, but the accommodations are in demand for the transatlantic voyage to and from that port.

One of the typical early post-war vessels is the Swedish liner *Erland* (Fig. 6), a modern motorship of 1634 gross tons and 739 net tons, with a service speed of 13 knots. The *Erland* has a length of 254 feet, a breadth of 42.2 feet, and a depth of 16.5 feet. It was launched in 1942 but because of the war was not commissioned until 1945. Its hull is especially strengthened for ice navigation.

The *Ragneborg* (Fig. 7) and the *Torsholm* (Fig. 8), with their streamlined superstructures, are typical of the most recently constructed ships introduced to the Great Lakes–Transatlantic route. The *Ragneborg* of the Swedish Chicago Line, built in 1947, is a motorship of 1671 gross and 843 net tons, and a deadweight tonnage of about 2900. Like most of the newer vessels, it has two decks, a cruiser stern, and a hull

[1] All vessel dimensions and other characteristics are from *Lloyd's Register of Shipping.*

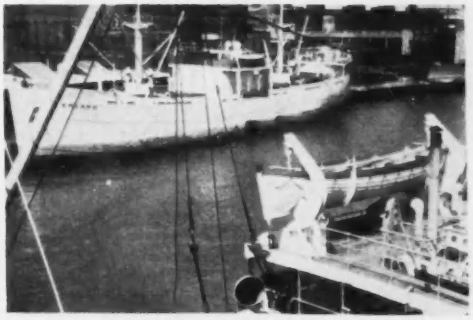


FIG. 5 (upper left). S.S. *Svanefjell* in the Chicago River. This vessel is typical of the liners constructed for Great Lakes–overseas service in the pre-war period.

FIG. 6 (upper right). M.S. *Erland*, one of the first postwar vessels to engage regularly in the Great Lakes-to-Europe trade.

FIG. 7 (lower left). M.S. *Ragneborg* of the Swedish Chicago Line, discharging in the Thames, London.

FIG. 8 (lower right). M.S. *Torsholm* of the Swedish American Line at berth in the Calumet River, Chicago.

which is strengthened for ice navigation. Its length is 252.7 feet, breadth 42.2 feet, and depth 16.3 feet. Although its normal draft in Great Lakes service is 13 feet 9¼ inches, it can load to as much as 18 feet 9¼ inches of draft in deep water east of Montreal.

The newest Great Lakes–overseas vessels have a somewhat larger cargo capacity than the older ones, because of improvements in design. These new ships, however, are no larger in overall dimensions than the older ones. A few of the recently built ships are designed to carry full cargoes on 14 foot draft, thereby eliminating the necessity of filling out cargo at Montreal. The fact that there are sufficient full cargoes to and from Great Lakes ports is indicative of the growing importance of the trade. Vessels with deadweight tonnage cargo capacity of 3500 tons, but with dimensions and draft no greater than the older ships, are now under construction.

SCHEDULES

The 11 companies which regularly operate between the Great Lakes and overseas ports each have sailings at least monthly during the navigation season; many of them have sailings weekly. During the 1952 season a total of 123 scheduled round trips were made into the Great Lakes west of the Welland Canal, and a number of additional voyages were made into Lake Ontario. Although the major ports on both sides of the Atlantic are served

TABLE III

SCHEDULED GREAT LAKES–OVERSEAS SERVICES, 1953

Line	*Nationality*	*Overseas Ports*
1. Ahlmann Trans-caribbean Line	German	La Guaira, Puerto Cabello, Maracaibo
2. Canuk Line	British	London, and other U. K. ports as cargo offers
3. Fabre Line	French	Casablanca, Lisbon, Tangier, Oran, Algiers, Marseille, Genoa, Leghorn, Naples
4. F. A. R. M. Line	French	Northern European ports
5. Fjell Line	Norwegian	Glasgow, London, Bergen, Stavanger, Oslo, Copenhagen, Antwerp, Rotterdam, Bremen, Hamburg
6. Hamburg Chicago Line	German	Antwerp, Rotterdam, Bremen, Hamburg
7. Manchester Liners, Ltd.	British	Liverpool, Manchester
8. Metron Line	American, using Norwegian ships	Antwerp, Rotterdam
9. Oranje Line	Dutch	Le Havre, Antwerp, Amsterdam, Rotterdam, Bremen, Hamburg
10. Swedish American Line	Swedish	Le Havre, Antwerp, Amsterdam, Rotterdam, Bremen, Hamburg
11. Swedish Chicago Line	Swedish	Gothenburg, Copenhagen, Malmo, Stockholm

in regular rotation in accordance with advertised schedules, the liners frequently call at additional ports when sufficient cargo is offered. Nearly all trips are scheduled to call both inbound and outbound at Montreal, and most trips make either one or two calls each at Toronto, Cleveland, Detroit, and Milwaukee. The great majority of the trips turn around at Chicago. Only a few liners which entered the lakes in 1952 did not call there, turning, instead, at other ports, principally Toronto and Detroit. A few trips reached Lake Superior ports instead of Milwaukee and Chicago.

The scheduled time in each direction between Chicago and the first European port averages about 22 days, of which ten are occupied between Chicago and Montreal, including time for working cargo at intermediate lake ports. The transatlantic voyage east of Montreal takes 10 to 12 days.

These scheduled times between Chicago and Europe are competitive with those of the rail-water routes through Atlantic seaboard ports. Aside from faster schedules of some passenger liners, especially from New York, the typical transatlantic voyage takes from eight to 12 days. The elapsed time for a shipment, from departure from Chicago until sailing from New York or other seaboard port, including loading on railroad cars, delays in the rail yards, transshipment at the port, and loading aboard vessel, is about ten days. The elapsed time between Chicago and Europe is, therefore, about the same whether by direct all-water or by transshipment on rail-water routes. The time may be reduced somewhat by truck haul to the Atlantic coast. Motor trucks, however, cannot handle many of the heavy and bulky shipments; and the delays awaiting entrance to the piers in New York Harbor, or awaiting scheduled sailings which are less frequent at other Atlantic ports, typically will equalize the elapsed time.

From Great Lakes ports east of Chicago the time is more in favor of the all-water route, because the reduction in elapsed time between Chicago and lake cities farther east is greater for the water route than for overland routes.

Some scheduled trips call at other than the major lake ports when sufficient cargoes are offered. This, however, rarely affects the over-all scheduled time for the voyage, because such outports are generally substituted for one or more regular ports of call. Among

the ports at which overseas vessels call irregularly are Duluth-Superior, Fort William, South Haven, Kenosha, Sheboygan, Green Bay, Muskegon, Toledo, and Buffalo. Many of the vessels call at the Imperial Oil Company refinery at Sarnia, Ontario, on the eastbound voyage for bunkering.

TRAFFIC

The Great Lakes–Transatlantic liner services handle general cargo, rather than primarily bulk shipments. The bulk commodities are more often handled by tramps in ship-load lots. The liner traffic is very diversified, and no single group of commodities predominates.

Table IV shows the post-war growth of the Great Lakes–overseas traffic at United States ports on the Lakes. The traffic at Canadian ports has shown a comparable growth, although detailed statistics on total Canadian Great Lakes–overseas trade are not available. At Toronto the direct overseas traffic in both directions increased from 37,160 tons in 1951 to 50,300 tons in 1952,[2] and at Hamilton from 2500 tons in 1951 to 15,328 tons in 1952.[3]

The Great Lakes ports of origin and destination of the direct overseas traffic are shown in Table V and on Figure 10. It will be noted that the volume of traffic handled at United States ports in 1950 and 1951 was nearly four times that handled at Canadian ports. Of the United States ports, Chicago, Detroit, Milwaukee, and Cleveland are the leaders. These are the ports supplied by overseas liner services on regular schedule. Chicago is by far the leading Great Lakes port for direct overseas traffic, handling well over one-third of the total of such traffic of all United States ports on the Great Lakes. The ports on Lake Michigan—Chicago, St. Joseph, South Haven, Kenosha, Milwaukee, Sheboygan, Muskegon, and Green Bay Harbor—together account for two-thirds of the total direct traffic between overseas and United States Great Lakes ports.

TABLE IV

GROWTH OF OVERSEAS TRAFFIC AT UNITED STATES PORTS ON THE GREAT LAKES, 1946–1951, IN CARGO SHORT TONS

Year	*Imports*	*Exports*	*Total*
1946	10,176	20,148	30,324
1947	23,054	43,720	66,774
1948	46,765	43,406	90,171
1949	63,966	73,618	137,584
1950	127,203	84,874	212,077
1951	107,234	103,667	210,901

Source: Compiled from Annual Reports of U. S. Corps of Engineers.

Toronto and Hamilton are the principal Canadian ports handling direct overseas traffic via the Great Lakes–St. Lawrence route. Sarnia and Fort William also handle such traffic regularly. Nearly all of the direct overseas traffic from Fort William is exported wheat, but it represents only a small part of the Canadian wheat exported from that port, most of it being moved in standard lake freighters for rail movement between Lake Ontario and seaboard ports, or in "canallers" for transfer to larger ocean-going ships at Montreal.

The principal commodities moving directly without transshipment between overseas ports and United States ports on the Great Lakes are shown in Tables VI and VII, which show imports and exports for 1950 of the major commodities by ports. The diversity of the commodities is evident. While nearly all of the exports are carried to ports in Europe, and more recently also North Africa, some of the imports originate elsewhere. Sugar, for example, im-

[2] Letter from J. B. Drylie, The Toronto Harbour Commissioners.

[3] Letter from H. G. Mallion, Hamilton Harbour Commissioners.

ported into Cleveland, originates in the West Indies. It is not possible, from the available information, to separate transatlantic from other overseas traffic, although, of course, the overwhelming proportion of the Great Lakes–overseas traffic is transatlantic.

The quantities of many of the commodities fluctuate greatly from year to year, so that the rank of the leading commodities in any given year is not necessarily significant.

Some commodities, such as iron and steel products, automobiles, and beer, move in important volume in both directions.

Among the imports, particularly noteworthy are the large tonnages of both primary raw materials and semi-finished products which arrive at Great Lakes ports from overseas in connection with the iron and steel and the metal fabricating industries of the principal lake port cities, especially Chicago and Cleveland. These are mostly specialized materials or products which are not produced, or are produced at higher costs, in the United States. Manganese and aluminum alloys, zinc, and other raw materials are examples. A considerable tonnage of pig iron, and iron and steel ingots and other primary products are imported for finishing in the steel mills of the Great Lakes area.

Wood pulp, the leading imported commodity in 1950, originates in Scan-

TABLE V

GREAT LAKES OVERSEAS WATER-BORNE TRAFFIC AT UNITED STATES AND CANADIAN PORTS, 1950 AND 1951

IN CARGO SHORT TONS

Port	*1950*			*1951*		
	Imports	*Exports*	*Total*	*Imports*	*Exports*	*Total*
Chicago, total	57,043	30,085	87,128	42,165	52,066	94,231
Chicago Harbor	25,183	14,004	39,187	12,569	15,915	28,484
Chi. San. and Ship Canal	1,543	.....	1,543	.....	.....	.....
Calumet Harbor and Riv	10,337	1,954	12,291	13,300	16,320	29,620
Lake Calumet	19,980	14,127	34,107	16,296	19,831	36,127
Kenosha, Wis.	.....	644	644	.....	.....	.....
Milwaukee, Wis.	7,054	21,355	28,409	6,370	6,547	12,917
Sheboygan, Wis.	11,243	.....	11,243	9,698	.....	9,698
Green Bay Harbor	5,088	2,911	7,999	5,088	965	6,053
St. Joseph, Mich.	.....	.....	.....	.....	28	28
South Haven, Mich.	5,758	.....	5,758	.....	.....	.....
Muskegon, Mich.	207	46	253	.....	.....	.....
Duluth-Superior	1,343	33	1,378	559	2,833	3,392
Port Huron, Mich.	4,025	.....	4,025	899	.....	899
Detroit, Mich.	21,397	8,641	30,038	26,945	12,967	39,912
Toledo, Ohio	842	10,292	11,134	130	8,975	9,105
Cleveland, Ohio	12,796	7,695	20,491	9,180	7,751	16,931
Erie, Pa.	280	.....	280	.....	.....	.....
Buffalo, N. Y.	125	3,169	3,294	.....	1,617	1,617
Total, United States ports	127,203	84,871	212,074	107,234	103,667	210,910
Canadian ports on Lake Superior	19	5,275	5,294	n.a.	n.a.	n.a.
Canadian ports, Great Lakes except Lake Superior, and St. Lawrence River above Montreal	28,176	31,801	59,977	n.a.	n.a.	n.a.
Total, Canadian ports	28,195	37,076	65,271	27,047	31,355	58,402
Total, all U. S. and Canadian ports above Montreal	155,398	121,947	277,345	134,281	135,022	269,312

n.a.—not available.

Sources: Compiled from: U. S. Dept. of the Army, *Annual Report of the Chief of Engineers, 1951, part 2, Commercial Statistics, Water-Borne Commerce of the United States for the Calendar Year 1950* and *idem, 1952*, for U. S. ports; Dominion Bureau of Statistics, *Shipping Report, Year December 31, 1950*, Ottawa, 1951, and *idem*, 1952, for Canadian ports total; Canadian ports on Lake Superior from passages reported by U. S. Corps of Engineers at Sault Ste. Marie.

TABLE VI

MAJOR COMMODITIES IMPORTED INTO UNITED STATES PORTS ON THE GREAT LAKES DIRECTLY FROM OVERSEAS, AND PRINCIPAL DESTINATION PORTS, 1950

Rank	*Commodity*	*Short Tons*	*Principal Destination Ports, with Tonnages*
1	Wood pulp	19,294	South Haven, 5,758; Green Bay, 5,088; Port Huron, 4,025; Detroit, 1,975; Duluth-Superior, 1,345
2	Iron and steel basic fabricated products	15,501	Detroit, 9,657; Chicago, 5,207
3	Clays and earths	12,925	Sheboygan, 11,243; Milwaukee, 1,682
4	Aluminum ore, concentrates, base alloys, and scrap	11,893	Chicago, 5,967; Cleveland, 5,491
5	Distilled spirits, malt liquors, and wines	9,456	Chicago, 8,120
6	Primary iron and steel products, except (7)	7,921	Chicago, 7,202
7	Iron and steel ingots, blooms, slabs, and billets	7,650	Chicago, 7,622
8	Coal-tar products	6,102	Detroit, 4,096; Chicago, 2,006
9	Manganese	3,472	Chicago, 3,472
10	Sugar	2,954	Cleveland, 2,954
11	Pig iron	2,774	Chicago, 1,392; Milwaukee, 1,119
12	Zinc metal and manufactures	2,646	Chicago, 2,646
13	Fish and fish products, except canned	2,475	Chicago, 1,115
14	Bituminous coal and lignite	1,650	Chicago, 1,650
15	Oilseeds	1,604	Chicago, 1,172
16	Hides and skins, raw, except furs	1,467	.....
17	Glass and glass products	1,373	Toledo, 763
18	Automobiles, trucks and buses	1,303	Chicago, 1,118
19	Vegetable products, inedible	1,250	.....
20	Bldg., monumental stone mfrs.	1,047	.....

dinavia, and is brought to the Great Lakes in both liners and tramps. The greater tonnage is handled in shiploads by chartered vessels, and is received at the smaller lake ports, where it is used in the paper industry.

Clays and earths are imported by the shipload for use in the Kohler plant, near Sheboygan, Wisconsin, which manufactures plumbing fixtures and uses the clays, from England, in bathtubs, bowls, and similar appliances.

A large proportion of the Scotch whiskey, Dutch and German beer, and French, Algerian, German, and Italian wine consumed in the Middle West is imported directly on the regular transatlantic liners which enter the lakes. In this way, the danger of breakage and pilferage in transshipment at New York or other seaboard ports is eliminated. These commodities are handled almost entirely in Chicago because of the location there of the major wholesale distributors serving the Middle West.

Other commodities which regularly move in fairly large volume into Great Lakes ports from overseas include manganese, special ores from Sweden, automobiles from England and France, and a wide variety of other manufactured products for distribution throughout the Middle West.

The variety of imports is increasing. Among the commodities which now move into Great Lakes ports from overseas are Spanish olives, marble from Italy, toys from Germany, cheese from Holland and Switzerland, bulbs and seeds from Holland, canned fish, halibut and cod liver oil from Norway, coal-tar products from northwestern Europe for use in the consumer markets and chemical industries of the Middle West, and special types of machinery from England, Germany, Switzerland, and other industrialized European countries.

The most important single class of commodity exported from the Great Lakes directly to overseas ports consists of iron and steel products, including both primary products such as ingots and pig iron, finished steel including sheets, bars, tubes, and structural

TABLE VII

MAJOR COMMODITIES EXPORTED FROM UNITED STATES PORTS ON THE GREAT LAKES DIRECTLY TO OVERSEAS, AND PRINCIPAL PORTS OF ORIGIN, 1950

Rank	*Commodity*	*Short Tons*	*Principal Ports of Origin, with Tonnages*
1	Petroleum coke	10,263	Toledo, 9,499; Buffalo, 764
2	Primary iron and steel mill products	6,877	Chicago, 6,859
3	Automobiles, trucks, and buses	6,486	Detroit, 4,439; Milwaukee, 698; Kenosha, 644
4	Petroleum products, not elsewhere classified	3,730	Cleveland, 3,688
5	Non-metallic minerals, not elsewhere classified	3,155	Chicago, 1,879; Buffalo, 1,207
6	Construction, excavating, and conveying machinery and parts	2,595	Milwaukee, 1,130; Cleveland, 625
7	Automobile, truck and bus parts, accessories and service equip.	2,546	Detroit, 1,256; Cleveland, 503
8	Meat products (other than canned) not elsewhere classified	2,299	Chicago, 2,163
9	Animal products, inedible, not elsewhere classified	2,258	Chicago, 1,754; Milwaukee, 504
10	Molasses, edible honey, sirup, and other related sugar products	2,230	Chicago, 2,012
11	Agricultural machinery, implements and parts, including tractors	2,209	Milwaukee, 1,360
12	Machinery and parts, not elsewhere classified	2,136	Milwaukee, 1,435
13	Corn	1,973	Chicago, 1,963
14	Mining, well, and pumping machinery and parts	1,681	Milwaukee, 1,639
15	Wheat flour	1,652	Buffalo, 1,195
16	Asphalt and bitumen, natural	1,600	Chicago, 1,521
17	Electrical machinery and apparatus	1,193	Milwaukee, 439
18	Clays and earths	1,145	Chicago, 1,145
19	Lubricating oils and greases	1,132	Cleveland, 1,128
20	Engines, turbines and parts, not elsewhere classified, except locomotives	1,091	.....

shapes, and fabricated steel products including many types of machinery and vehicles. Chicago is by far the most important port shipping these items; it is the largest steel producing center directly on the Great Lakes and is also the most important producer of manufactured iron and steel items, including machinery, in the United States.

The importance of Milwaukee in the direct overseas shipment of machinery is striking, particularly in view of the greater importance of Chicago in its manufacture. Although a considerable proportion of the machinery exported from Milwaukee is manufactured in that metropolitan area, much of Chicago's direct overseas export of machinery is loaded aboard ship in Milwaukee, moving from there to Europe after a rail or truck haul from Chicago.[4] The reason for the land movement between Chicago and Milwaukee is apparently the fact that Chicago has no waterfront crane available to commercial shipping capable of handling loads of more than 15 tons, while Milwaukee's Board of Harbor Commissioners owns and operates a crane with a 90-ton capacity.

Chicago's importance as an agricultural and meat packing center is reflected in its importance as the originator of a considerable tonnage of foodstuffs, both vegetable and animal, in direct overseas trade. A movement of animal oils and fats, begun on a large scale in 1951, continued through 1952, and appears to be a regular contributor to the movement from the Great Lakes overseas. This traffic consists mainly of lard, which moves from Chicago in drums aboard the regular liners, and also in bulk on small chartered tankers (Fig. 11). In 1951 animal oils and fats constituted the largest single class of commodity exported from the United States in direct overseas trade from the Great Lakes.

Petroleum coke is a major commodity handled in direct Great Lakes–overseas trade. Although it ranked first in 1950

[4] Edward Hamming: "The Port of Milwaukee," Department of Geography, The University of Chicago, Research Paper No. 26, 1952.

and third in 1951, it increased by nearly one-third in tonnage between the two years. The shortage of fuels in Europe is responsible for the growing importance of that movement.

Automobiles, trucks, and buses are moving directly between Great Lakes and overseas ports in increasing quantity. Detroit is, of course, the largest contributor to that movement, but Nash automobiles have been moving to Europe directly from Milwaukee and Kenosha, and Willys automobiles and jeeps are loaded aboard ship in Toledo. Studebaker cars are exported directly to Europe from a new plant located at Hamilton, Ontario. Automobile parts move to Europe from Detroit and Cleveland. It is interesting to note that the increased popularity of small European automobiles in the United States is reflected in a growing traffic in such cars by the all-water route to Middle Western markets, as well as to Canadian distributors in Toronto.

A movement of unusual interest took place late in 1951 when several liners carried a fleet of 500 second-hand former Chicago taxicabs to Helsinki, Finland, for use in transporting crowds to the Olympic games.

Another unusual movement took place in September, 1952 from Milwaukee, when the British tramp *Ballyholme Bay*, after having discharged an inbound cargo of wood pulp from Newfoundland at Detroit, proceeded to Milwaukee where it loaded 600 tons of bottling machinery and other brewery equipment for South America.

TABLE VIII

IMPORTS AND EXPORTS IN DIRECT GREAT LAKES–OVERSEAS MOVEMENT AT UNITED STATES PORTS ON THE GREAT LAKES, 1951, BY COMMODITIES, IN CARGO SHORT TONS

Imports			*Exports*		
Rank	*Commodity*	*Tons*	*Rank*	*Commodity*	*Tons*
1	Iron and steel basic products except (3) and (7)	24,173	1	Animal oils and fats, edible	18,919
2	Wood pulp	15,236	2	Automobiles, trucks, and buses	14,966
3	Primary iron and steel mill products	14,478	3	Petroleum coke	14,402
4	Clays and earths	9,698	4	Primary iron and steel mill products	8,391
5	Distilled spirits, malt liquors, and wines	9,299	5	Coal-tar products	5,826
6	Glass and glass products	6,134	6	Animal feeds, not elsewhere classified	4,859
7	Iron and steel ingots, slabs, and billets	5,609	7	Non-metallic minerals, not elsewhere classified	3,030
8	Fish and fish products	2,466	8	Automobile, truck, and bus parts, service equipment and accessories	2,798
9	Coal-tar products	2,291	9	Petroleum products, not elsewhere classified	2,779
10	Fruits and fruit preparations (not canned)	1,281	10	Meat products (except canned)	2,126
11	Vegetable products, inedible, not elsewhere classified	1,165	11	Construction, excavating, and conveying machinery and parts	1,851
12	Other non-ferrous ores and products, not elsewhere classified	1,103	12	Agricultural machinery, implements and parts, including tractors	1,510
13	Animal products, inedible, not elsewhere classified	1,038	13	Industrial chemicals	1,190
14	Hides and skins, raw, except furs	987	14	Machinery and parts, not elsewhere classified, except agricultural	905
15	Paper, related products, and manufactures, not elsewhere classified	899	15	Textile products, not elsewhere classified	903
16	Cocoa, chocolate, coffee preparations	818	16	Iron and steel manufactures, not elsewhere classified	872
17	Machinery and parts, not elsewhere classified, except agricultural	786	17	Tin metal and manufactures, including scrap	802
18	Building, ornamental and other stone manufactures	734	18	Clays and earths	717
19	Aluminum ore, concentrates, base alloys, and scrap	606	19	Chemical specialties	695
20	Iron and steel manufactures, not elsewhere classified	574	20	Mining, well, and pumping machinery	652

Source: Compiled from U. S. Dept. of the Army, Corps of Engineers, *Water-borne Commerce of the United States, Calendar Year 1951*, preliminary release November, 1952.

The Great Lakes–Caribbean service, begun in 1953, is carrying a wide variety of manufactured products and canned foods from Great Lakes ports, and returning with tropical products such as coffee and sugar.

On most water transportation routes, it is important, for economical utilization of the vessels, to secure an approximate balance of tonnage in each of the two directions, or at least, if there is a significant directional unbalance, to secure cargoes in the direction of lighter tonnage movement which can move on higher rates because of higher value in proportion to the tonnage. Most routes have decided directional unbalances, for bulky, relatively low-rate raw materials are imported and higher-valued products are exported, or vice versa. Between western Europe and eastern and midwestern North America, however, the cargoes are more nearly balanced, for both are highly industrialized and urbanized regions. Both raw materials and finished products move in both directions in a complementary trade. Furthermore, both regions serve as gateways for the productive agricultural hinterlands beyond them. The Great Lakes–St. Lawrence route, furthermore, parallels the main axis of the North American manufacturing belt. The ports directly on the route include four of the eight top-ranking metropolitan areas of the United States in importance as measured by manufacturing employment and production, as well as five of the eight leading manufacturing centers of Canada. In addition, many of the other leading manufacturing areas on both sides of the international boundary, including St. Louis, Cincinnati, Pittsburgh, London (Ontario), and Ottawa, are readily and quickly accessible to ports on the Great Lakes and the St. Lawrence River. At the European end of the route, virtually all of the major ports and cities are either directly served by scheduled

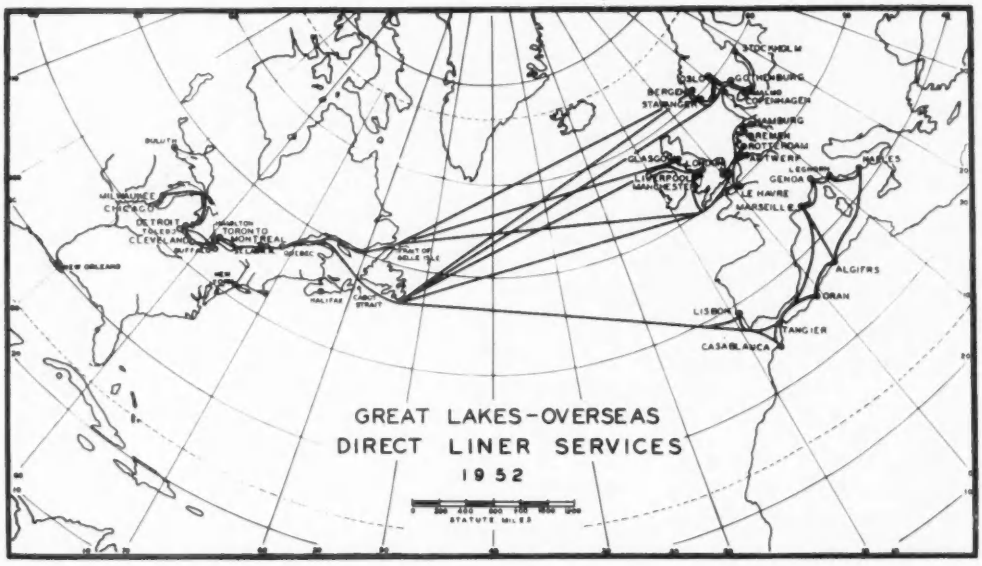


FIG. 9. Map of Great Lakes–Overseas Direct Liner Services, 1952, showing extent of the routes having regular service by the seven shipping lines operating between the Great Lakes and European and North African ports.

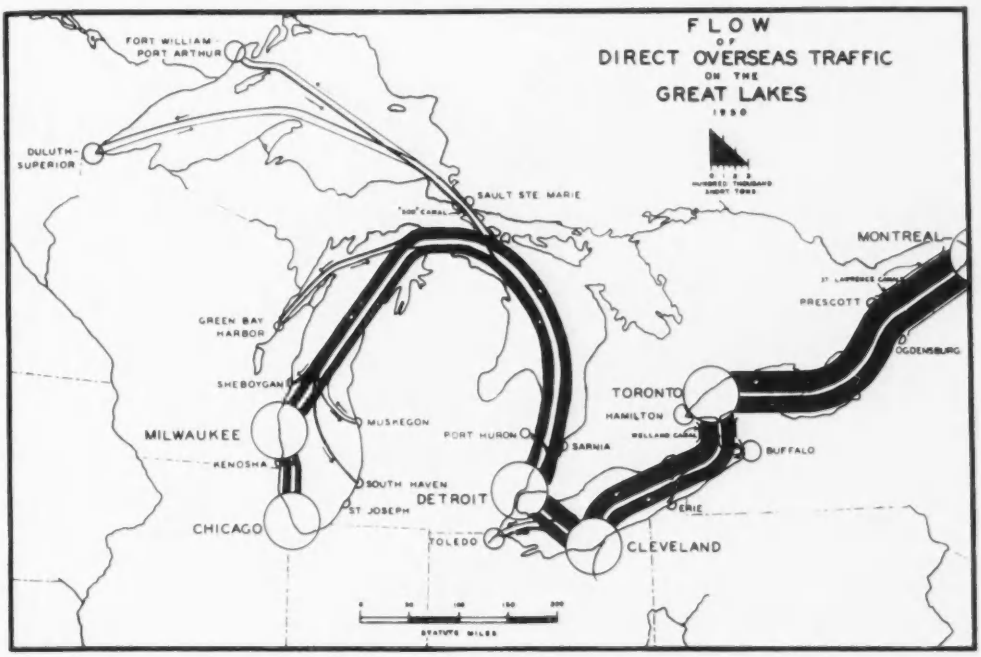


FIG. 10. Flow map of direct overseas traffic on the Great Lakes, 1950, showing relative volume of traffic in each direction between Great Lakes ports and overseas.

Great Lakes–overseas liners, or are served irregularly when cargo offerings justify.

With such a large number of ports, including both producing and consuming centers at both ends of the route, the Great Lakes–Europe route is unusually favored by a well-balanced movement in both directions.

Because of the wide fluctuations in movement of particular commodities from year to year, there is a tendency for cargo unbalances to exist in any given year, but such unbalances are apt to be in either direction, and a reverse unbalance may develop in the following year. In 1951 the cargo movements in the two directions were very nearly balanced.

If vessels, operating on schedule, depart from a given port, either on the Great Lakes or in western Europe or the Mediterranean, with unused cargo tonnage or space capacity, they can nearly always fill out their loads at other ports prior to the transatlantic portion of the voyage. An unbalance at any given port in a particular year or season is generally compensated by an unbalance in the reverse direction at other ports along the route. In 1951 the excess of eastbound over westbound traffic at Chicago was counterbalanced by a greater westbound movement at other Lake Michigan ports. Furthermore, vessels en route to or from United States ports on the Great Lakes have the opportunity to compensate for directional unbalances by handling traffic to or from Canadian ports on Lake Ontario and the St. Lawrence River, especially Toronto, Hamilton and Montreal.

Flexibility also results for voyages between the Great Lakes and overseas by occasional movements of cargo between United States Great Lakes ports and Canadian lake ports west of the

St. Lawrence canals. Such traffic is not normally solicited by the overseas lines. Although foreign-flag vessels are prohibited from engaging in trade between two United States ports or between two Canadian ports, there is no restriction placed upon movements between United States and Canadian ports. The virtual disappearance of package freight steamship operation under the United States flag on the Great Lakes has opened up the possibility for handling of such traffic as, for example, between Chicago and Toronto, on vessels en route overseas. Such vessels, which must operate through the St. Lawrence canals on light draft, can carry traffic within the lakes in excess of the loads that can be carried between lake and overseas or lower St. Lawrence ports. Such traffic, however, has not developed beyond an occasional movement, since World War II.

Overseas vessels sometimes take bulk cargoes between Canadian and United States ports on the Great Lakes. In 1952 two German vessels were chartered to move eleven cargoes of grain from Fort William to United States ports. Among the outbound cargoes were seven loads of grain for Montreal and five in direct overseas movement.

Nearly all of the vessels engaged in direct Great Lakes–overseas trade are designed to operate in salt water at drafts deeper than the 14-foot limitation imposed by the St. Lawrence locks. They therefore fill out their loads eastbound, and partially discharge westbound, at Montreal, and occasionally at other lower St. Lawrence River ports, including Three Rivers and Quebec. Vessels in the Great Lakes–overseas trade load to 19 or 19½ feet east of Montreal. In the services between Montreal and Europe they thus compete with the lines operating the larger standard-sized ocean freighters in service between Montreal and Europe. Because of the large volume of traffic at Montreal, however, the vessels bound to and from the Great Lakes rarely have difficulty in competing for the Montreal-Europe business. Rates are the same regardless of the vessel. Some lines, such as the Swedish American and the Manchester lines, operate Montreal-Europe services in which the smaller Great Lakes vessels alternate with larger ocean freighters of the same lines, thereby offering greater frequency for shipments originating, terminating or transshipping at Montreal.

The difference between the loads carried east and west of Montreal is greater than the amount indicated by the difference in draft of the vessel between the Great Lakes and the lower

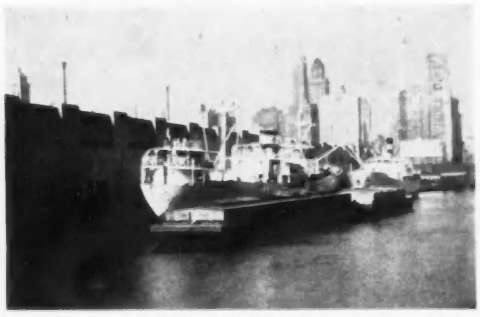


FIG. 11 (left). A foreign-flag tanker leaving Chicago with a cargo of soybean oil and bulk lard for Europe.

FIG. 12 (right). Transshipment of cargoes from barges of the Lakes-to-Gulf Waterway to Great Lakes–overseas vessels, at Chicago.

TABLE IX

COMPARISON OF RATES VIA DIRECT ALL-WATER AND VIA COMBINATION RAIL-WATER ROUTES TO ANTWERP AND/OR ROTTERDAM FROM GREAT LAKES CITIES FOR SELECTED COMMODITIES

(Rates as of Autumn, 1952; in cents per 100 pounds)

(Combination rail-water rates are compiled as ocean rates from seaboard ports plus railroad export carload rates)

Origination and Commodity	*All-water Rate*	*Combination Rate, Via New York*	*Combination Rate, Via Baltimore*	*Combination Rate, Via Montreal*
FROM CHICAGO				
Machinery, not otherwise specified	220	301	298	299
Canned goods, in boxes	125	181	177	193
Edible lard, in drums	145	188	153	185
Dry salt fatbacks	155	213	...	210
Empty glass one gallon bottles	180	218	211	219
Corn syrup and glucose	90	131	115	129
FROM MILWAUKEE				
Machinery, not otherwise specified	220	305	301	...
Canned goods, in boxes	125	179	177	...
FROM DETROIT				
Machinery, not otherwise specified	200	283	280	279
Corn syrup and glucose	90	131	...	144
FROM CLEVELAND				
Machinery, not otherwise specified	210	265	262	262
Empty glass one gallon bottles	130	199	194	196
FROM TORONTO				
Machinery, not otherwise specified	230	...	...	274
Canned goods, in boxes	125	...	...	189
Corn syrup and glucose	90	...	...	164

St. Lawrence River and Atlantic Ocean. Vessels ride higher in salt water than in fresh water. This difference or "squat" between fresh water and salt water drafts with the same load is as much as a foot of draft for the small vessels which operate in the Great Lakes–overseas services.

RATES

Rates for cargo movement through the present St. Lawrence route between the Great Lakes and overseas points are generally considerably less than the competitive combination rail-water rates with transshipment at eastern seaboard or St. Lawrence River ports. Although the differential varies widely for different commodities, it is generally from 10 to over 30 per cent less for the direct all-water movement than for rail-water movement.

A comparison of typical rates for selected commodities via the direct all-water route and via rail-water routes with transshipment is given in Table IX. All of the movements shown in the table are those which actually take place regularly. The all-water rates are those stated in the tariffs of the direct Great Lakes–overseas shipping lines; the rail-water rates are combinations of export rates for the rail movement plus the ocean rates quoted by transatlantic steamship lines operating from east coast and St. Lawrence ports. To the combination rail-water rates must be added, in many instances, costs of transshipment at the eastern ports. Although free lighterage is provided by the railroads at New York on most through movements, there are frequently extra charges for heavy lifts and other special services. These extra charges, when incurred, further increase the differential between the costs of direct all-water movement and rail-water movement with transshipment.

Rates charged by all the steamship lines in the Great Lakes–overseas trades

are competitive with one another. Three of the lines—Fjell, Oranje, and Hamburg-Chicago—have formed a conference for the Great Lakes-London-Bordeaux-Hamburg Range. The nonconference lines match the conference rates on most movements. Although there is no conference for rate-making between the Great Lakes and Mediterranean ports or Scandinavian ports, rates quoted by all steamship lines in those trades are also competitive. Several of the lines serving the Great Lakes are also members of the Canadian-Continental conference and quote rates between Canadian east coast and St. Lawrence ports on overseas movements which are competitive with the other steamship lines that do not enter the Great Lakes. Changes in the level of freight rates by transatlantic steamship lines between east coast and European–North African ports are quickly reflected in rate changes by the Great Lakes–overseas lines.

Rates charged by the Great Lakes–Caribbean service are at least 10 per cent under the combination rail-water rates through Atlantic and Gulf coast ports, and are competitive with, or lower than barge-ocean rates via the Lakes-to-Gulf inland waterway from Chicago with transshipment at New Orleans.

In addition to the port-to-port rates, the Great Lakes–overseas lines are also concerned with competitive rates via lake ports and via eastern seaboard ports to and from inland points in the United States and Canada which are not directly served by the Great Lakes. The hinterland of the lake ports is determined by such competitive rate differentials.

Although statistics are not available

TABLE X

COMPARISON OF RATES VIA GREAT LAKES PORTS AND VIA ATLANTIC SEABOARD PORTS TO ANTWERP AND ROTTERDAM FROM INLAND CITIES FOR SELECTED COMMODITIES

(Rates as of Autumn, 1952; in cents per 100 pounds)

(All rates are combinations of export carload rates to seaboard ports or domestic carload rates to Great Lakes ports; thence water rates)

Origination and Route	*Machinery Not Otherwise Specified*	*Canned Goods, in Boxes*	*Edible Lard, in Drums*	*Dry Salt Fatbacks*	*Corn Syrup and Glucose*
FROM MINNEAPOLIS					
Via Milwaukee and water	296	176	199	215	146
Via New York	355	213	235	267	199
Via Philadelphia	351	210	233	265	196
Via Baltimore	349	207	231	263	195
Via Montreal	351	225	233	265	196
FROM PEORIA, ILL.					
Via Chicago and water	289	164	204	187	118
Via New York	289	187	195	220	136
Via Philadelphia	305	182	192	285	151
Via Baltimore	303	181	191	284	149
FROM ST. LOUIS					
Via Chicago and water	287	171	193	203	127
Via New York	311	186	202	284	138
Via Philadelphia	309	184	199	282	136
Via Baltimore	308	183	198	281	135
Via Montreal	309	199	199	224	163
FROM CINCINNATI					
Via Cleveland and water	294	160	200	247	139
Via New York	278	166	176	245	138*
Via Philadelphia	276	163	174	243	136*
Via Baltimore	275	162	173	242	134*
Via Montreal	276	178	174	199	145

*Domestic rates for rail movement, Cincinnati to seaboard ports.

to show the proportion of the Great Lakes–overseas movement which originates and terminates at inland points in the United States and Canada not directly on the Great Lakes, it is apparent that the greatest proportion of the Great Lakes–overseas trade originates and terminates in the metropolitan areas of the Great Lakes port cities. Nevertheless, a not inconsiderable proportion moves overland to and from the Great Lakes ports. The railroads do not have special export-import rates between inland points and lake ports, as they do between those points and ports on the eastern seaboard; for they do not wish to short-haul themselves. Consequently the railroad rates are relatively higher to and from the lake ports, thereby restricting the hinterland areas within which the lake ports can compete with seaboard ports for direct overseas movement. A few representative rates between inland and overseas points are shown in Table X for movement via lake ports and via seaboard ports.

A very large proportion of the movement between inland points and lake ports is by motor truck, generally at rates somewhat lower than the rail rates.

An increasing volume of the traffic in direct overseas trade which moves between midwestern points and Chicago for transshipment through there is by barge. Transshipment between barge and ocean vessel in the Chicago and Calumet rivers is fairly common (Fig. 12), but the growth of that movement is somewhat restricted by the present inadequacy of the two connections—the Chicago Sanitary and Ship Canal and the Calumet Sag Channel—between Chicago and the waterways of the Mississippi River system.[5] Although a Federal project for enlargement of the Calumet Sag Channel was authorized in 1946, no funds have been appropriated, largely due to the lack of an appropriate agency to consolidate the required local cooperation in the Chicago region. The organization of the new Chicago Regional Port District may help to overcome the difficulty.[6] Chicago and Calumet harbors, connected with the Illinois Waterway by the Chicago Sanitary and Ship Canal and the Calumet Sag Channel, respectively, are the only places where there is direct all-water connection between the Mississippi Valley waterways and the Great Lakes. The establishment of through all-water rates with transshipment between barge and ocean vessel at Chicago is a future possibility. Such through rates would enable the Great Lakes–overseas direct all-water trade to be extended more effectively into the hinterland of the Mississippi Basin, including such cities as Peoria, St. Louis, Memphis, Louisville, Cincinnati, and Kansas City.

ADVANTAGES OF THE DIRECT ROUTE

The principal advantage of the direct Great Lakes–overseas shipping route is, of course, the rate differential as compared with the rail-water route. The fact that the elapsed time from origin to destination is generally comparable to the time via the rail-water routes, including transshipment delays en route, enables the direct services to offer reasonably effective competition, except during the winter months when the St. Lawrence route is closed.

The direct all-water route offers several other advantages. Transshipment almost always involves some

[5] J. Edwin Becht: " 'Turning Tows' on the Illinois-Mississippi Waterway," *Journ. of Geogr.*, Vol. 50, 1951, pp. 353–360.

[6] Chicago Regional Port District, "Where Two Great Waterways Meet," *First Biennial Report of the Chicago Regional Port District Board*, Chicago, 1953.

danger of damage or of loss due to handling or pilferage. The use of the direct route enables the shipper to avoid transshipment at seaboard ports. Costs of marine insurance via the direct route reflect that condition. Certain cargoes which regularly use the Great Lakes–overseas route are particularly subject to damage in handling and to pilferage. Whiskey, for example, is imported into the Middle West almost exclusively via the direct all-water route. Bulky machinery, exported from the Great Lakes cities, can more easily move on the all-water route, avoiding the restrictive clearance along the railroad lines and the cost of additional heavy lift or other special handling at the seaboard ports. Unfortunately, however, Chicago and several other lake ports are not provided with adequate cranes to load such shipments, and they must often be diverted to other lake ports, particularly Milwaukee, for loading.

Delays at the more congested ocean ports are avoided by the use of the direct all-water route to and from the Great Lakes. Many of the transatlantic freighters sail from obsolete piers, especially at New York and Boston, with inadequate landward access, thereby necessitating arrival of freight several days in advance of the scheduled sailing. Storage space on the piers, furthermore, is limited, and the result is that not uncommonly shipments cannot be handled on the earliest vessels to sail to the destination port.

The unsettled labor conditions at the east coast ocean ports have been a contributing factor to the growth of the direct Great Lakes–overseas trade. The frequency of strikes by tugmen and longshoremen at ocean ports has not been paralleled by similar unsettled conditions at Great Lakes ports, with the result that there has been some diversion of freight from time to time to the direct all-water route. Shippers, having under those circumstances learned of the availability and economy of the direct services, often continue to use them regularly.

FUTURE PROSPECTS

The future of the Great Lakes–overseas direct trade involves consideration of two aspects: (1) its potentialities without, or prior to, the carrying out of the proposed enlargement of the St. Lawrence Seaway, and (2) after completion of the proposed enlargement.

If the proposed seaway enlargement is carried out, it will be at least five years before the completed channel will be available for deep-draft ocean vessels to enter the Great Lakes, and possibly longer before the lake ports will complete adequate harbors for the accommodation of the deeper drafts. Whether or not the Seaway project is completed, the prospect for expansion of the direct Great Lakes–overseas trade in the next few years is dependent upon a number of conditions, some of which are beyond the ability of anyone to forecast at the present time.

The continued increase in the fleet of vessels especially designed for the trade indicates the confidence of the operators in prospects for the future of the route even without its physical enlargement. Each of the existing eleven companies has new vessel tonnage under construction or planned for Great Lakes–overseas service. Improvements in vessel design are resulting in greater deadweight cargo capacity without increase in the dimensions of the vessels or in their draft beyond the 14-foot limit imposed by existing locks. Some of the newest vessels will be able to enter and leave the lakes with full capacity, no longer depending upon Montreal or other deep water ports to round out

their cargoes. Several of the operators are investing in a greater proportion of their own tonnage, rather than relying upon charters, as in the past. The Fabre Line, for example, which until the end of the 1952 season used chartered Norwegian-flag vessels, is placing in service its own specially-constructed ships under the French flag.

On the other hand, a world-wide shrinkage in ocean commerce, which began about May, 1952, has temporarily created an excess of shipping, causing the retirement of many of the large ocean freighters. Because of their specialized design, however, the ships used in the Great Lakes–overseas trade have not been affected by the surplus of standard ocean freighters. Furthermore, in periods of low traffic, it is often possible economically to employ smaller vessels on ocean routes where insufficient traffic is available to make economic the operation of larger ships.

Improvements in port facilities for more efficient cargo handling and vessel turn-around are essential if the Great Lakes ports are to retain and increase their present volume of direct overseas shipping. Although Great Lakes ports are world-famous for their efficiency in handling millions of tons of cargo annually, and for extremely fast loading and unloading of vessels, most of the port facilities are highly specialized, designed for vast tonnages of bulk cargoes—ore, coal, stone, and grain—handled in vessels especially designed for the facilities. These port facilities are not adapted for general cargoes of the type carried in Great Lakes–overseas trade. The virtual disappearance of package freight trade locally on the Great Lakes during and since World War II was accompanied by conversion of the terminal facilities to other uses. Few Great Lakes ports now have adequate terminal facilities for the existing direct overseas trade, and any substantial expansion of the traffic must be accompanied by new general cargo port terminal facilities.

The future of the Great Lakes–overseas shipping route, like that of all shipping routes, depends basically upon the economic, political, and military conditions throughout the world which affect the total volume of international trade. The changing policies of the United States are quickly reflected in the volume of its foreign trade. The future of the foreign-aid program, the situation in western Europe, the needs of both peaceful and military commerce—all will be reflected in the future of the Great Lakes–overseas shipping route.

Some of the conditions affecting development of the route may be temporary. The solution of the labor difficulties at eastern seaboard ports will remove one of the reasons for utilization by shippers of the Great Lakes–St. Lawrence route. A greater emphasis must then be placed upon economy in operation of the ships and ports along the route in order to retain the present favorable competitive relationships.

Industrial expansion in the Great Lakes area of the United States has more than kept pace with that of the rest of the nation. The Chicago Metropolitan Area led the nation in the amount of postwar industrial expansion, and the other manufacturing areas on the lakes also experienced rapid growth of manufacturing and trade. A large share of Canada's postwar industrial expansion has taken place in the Great Lakes area of southern Ontario, particularly in the vicinities of Toronto, Hamilton, Windsor, and Sarnia, all of which are ports directly on the Great Lakes–overseas route.

It is very unlikely that American-flag vessels will participate to any great

extent, if at all, in the direct Great Lakes–overseas trades. Few American ship operators in foreign trade can succeed without heavy government subsidies in the form of construction- and operation-differential payments to compensate for lower costs of shipbuilding and operation under foreign flags. In order to be eligible for such subsidies, vessels must be operated on routes officially designated as essential to the foreign trade of the country by the United States Maritime Administration. The Great Lakes–overseas routes have not been so designated, nor are they likely to be in the forseeable future. For this, there are two reasons. First, the total volume of traffic on the route, although growing rapidly, still represents a very insignificant proportion of the total foreign trade of the United States. Second, the very nature of the route, which limits vessels to two or three, or at most four, round trips per year, and with rates for the entire distance but slightly above those for movement between overseas and eastern seaboard ports where fast vessels can make two or three round trips for every one made by the Great Lakes–overseas ships, necessitates an extremely low-cost operation. Foreign vessels, with their lower wage rates, can operate on the route far more economically than can American-flag vessels.

It is not the purpose of this paper to add to the vast existing literature relative to the St. Lawrence Seaway project. Should the Seaway enlargement be completed, however, a major change will result in the traffic of the Great Lakes–overseas route. A large proportion of the ocean freighters of the world will then be physically able to reach ports on the Great Lakes. The ports will undoubtedly provide eventually for facilities to handle a much larger volume of traffic than is now handled on the present limited waterway. New vessels will be designed and built for the Great Lakes–overseas route far larger than those presently employed on that route. Such vessels will incorporate in their design provisions for carrying the maximum possible deadweight tonnage of cargo within the limitations of draft in the enlarged Seaway. Several steamship lines have already announced plans for such vessels.

The present vessels employed upon the Great Lakes–overseas direct all-water route will, therefore, face competition from larger and newer vessels. Furthermore, it is possible that the Seaway enlargement may be completed before most of the postwar vessels now engaged in the Great Lakes–overseas trade, and those now under construction for that trade, are amortized. But that is not deterring the present operators from planning expansion of their fleets. There are many other trades throughout the world, involving small harbors and outports where the present ships and newer ones of comparable size can be profitably employed and where larger vessels must be excluded. Furthermore, it is believed that there will be a need for small ships in the direct Great Lakes–overseas trades for many years after enlargement of the Seaway, in order to provide the frequency and regularity of service that will be required in the process of developing the traffic to the point at which employment of larger vessels on regular schedules will be economic.

CONCLUSION

Small though the present volume of direct Great Lakes–overseas traffic is in comparison with its potentials after enlargement of the Seaway, it is an opening wedge in the development of commerce on the route. The present

vessel operators are developing "know how," contacts, and customers preparatory to expansion of their participation in Great Lakes–overseas trade, if and when the St. Lawrence Seaway enlargement takes place. The advantages of a "head start" over their future competitors may pay dividends later. Each of the present operating ship lines in the Great Lakes–overseas trade either has, or is planning for early construction, a fleet of vessels much larger than those now able to reach the lakes, for use in Great Lakes–overseas direct all-water trade through the enlarged St. Lawrence Seaway.

POPULATION PRESSURE AND NATIONAL RESOURCES

SOME OBSERVATIONS UPON THE ITALIAN POPULATION PROBLEM

M. J. Wise

Dr. Wise, Lecturer in Geography at the London School of Economics and Political Science, has traveled extensively in Italy, where he was in military service from 1944 to 1946.

AT the very root of the many problems which beset the economic life of modern Italy lies the long-standing burden of population pressure. In the years since the conclusion of the Second World War this problem has developed in a highly acute form, manifested, for example, in the disproportionately large number of unemployed, or only partially employed, men and women, while no obvious or immediate solution exists to redress the balance between the large available force of labor and the limited opportunities for employment which the country can provide. It is hardly possible to read any account of the Italian economy without finding some expression of the severity and effects of this problem. The provisional results of the census of November, 1951, have shown a further increase in over-all density of population since 1936 (the date of the last previous census) of 15.7 per square kilometer, to a figure of 155.3 per square kilometer, which is, as recently expressed, "molto elevata se si tiene presente la natura montuosa di gran parte del nostro territorio."[1]

Attention has been drawn to the problem in Britain by recent attempts to establish Italian workers in some important British industries; there seems to be, however, a general lack of awareness of the magnitude of the problem or of its inherent dangers. This review has been written with the object of drawing attention to a number of aspects of the Italian demographic situation particularly interesting from the geographical standpoint and of assessing the possibilities of redressing the lack of balance between population and national resources in the immediate future. Italy's population problem is clearly closely linked with the geographical circumstances of the country; certainly, no proper appreciation of the human geography of Italy can be reached without a consideration of the causes, symptoms, and effects of this basic problem.

Background of the Problem

The history of the Italian population problem over the last hundred years is well known and it will not be considered here in detail. Briefly, actual totals of population have risen from some 25 millions in 1861 to 33.5 in 1901, to 40.77 in 1931, and to the 1951 total of about 47,000,000.[2] This represents an essentially constant rate of increase. The rate of increase prior to the mid-1920's would have been much greater but for

[1] Translated: very high, considering the mountainous character of a large part of our territory. Relazione Generale sulla Situazione Economica del Paese presentata del Ministro del Tesoro: Camera dei Deputante Doc. IX N. 3 (March 31, 1952), p. 23.

[2] According to the published figures of the Istituto Centrale di Statistica. Figures quoted are for population within the present boundaries.

the striking record of emigration from Italy to Western Europe and to the New World.[3] At the opening of the twentieth century, on the average, over half a million emigrants were leaving Italy each year: the peak year in the flow was reached in 1913 when no less than 872,598 left Italian territory, 376,776 of them destined to reach the United States of America. These figures are considerably reduced when the number of repatriates to Italy are deducted, but for 1913 a net outflow of over 580,000 emigrants was recorded.

Emigration entered a new phase after the first World War, for in the 1920's and 1930's a number of factors combined to slow and eventually halt this outward flow. As is well known, the imposition of immigration restrictions by the United States of America quickly reduced the totals emigrating to the former principal reception area. During the five years 1906–10 an annual average flow of not less than 266,220 had been recorded to the United States, but comparable figures for 1921–5 show an average of only 45,194. Taking into account repatriates from the United States to Italy, these figures become respectively 125,195 and 1899. In 1931–5 an average of 13,244 emigrated annually to the United States but 14,110 returned. Further steps to restrict all but essential migration were adopted in Italy itself under the autarkic policy of the Fascist Government, which also initiated, as part of a deliberate policy, plans to raise the birth rate, which after 1921 had shown a tendency to fall. This policy has not been without its effect upon the present demographic situation. Thus, during the inter-war years, emigration played a diminishing part in solving Italy's problem of surplus population, whereas, Government policy, for reasons not unconnected with national prestige, aimed at increasing the total population of the country to an impressive extent.[4]

It is important to consider, also, some aspects of the country's demographic situation and the extent to which the total population of Italy is likely to grow in the near future. Here it may be as well to begin by examining the changes in birth and mortality rates over the last half century. The live birth rate for the period 1881–90 showed a yearly average of 37.8:1000. For the period 1901–10 this fell to 32.7, for 1921–30 to 28.4, and for 1936–40 to 23.3. Following a sharp rise in the immediate postwar years the rate fell again to 18.4 in 1951. Death rates have shown a somewhat similar fall, an important factor in which has been the lowering of rates of infantile mortality, from 27.3:1000 in 1881–90 to 16.7 in 1921–30, 12.1 in 1946, and 10.3 in 1951. With the exception of the wartime years there has been, however, no great change in the excess of live births over deaths, for the figure of 10.5:1000 for 1881–90 may be compared with 11.6 for 1921–30 and 10.5 for 1946–49. It is true that in the 1930's the figure fell to just below 10 while, more significantly, there has been a recent important downward trend from 9.8 in 1950 to 7.6 in 1952.

Average statistics for the country as a whole can be, however, somewhat misleading in that they tend to mask the great diversity which demographic trends exhibit when considered regionally. Here, as in so many other ways, there are most marked contrasts between the provinces of northern Italy

[3] For recent surveys of the history of emigration see Giovanni Parlato: "L'emigrazione Italiana nel Mondo," *L'Universo*, Vol. 30, 1950, pp. 726–743; and Emilo Fazio: "Sviluppi e Cartteri del Movimento Migratorio dei Paesi Mediterranei," *Annali di Statistica*, Vol. 8 (ii), 1948.

[4] See, for example, D. V. Glass: "Population Policies and Movements in Europe," 1940, pp. 219–269.

and those of the center and the south. In an interesting paper, Somogyi has examined, by provinces, changes in the rates of natural increase since 1881.[5] In 1881–5 provinces exhibiting the highest excess of live births over deaths were Sicily (14.2:1000) and Apulia (13.5). The corresponding figure for Piedmont was 8.9, for Lombardy 10.5, and the lowest figures (Lazio and Liguria) were 7.7. In the 1946–9 period Calabria (19.1) had the highest figure. Apulia and Campania (17.8 and 17.0) were almost as high, but, at the other end of the scale, Lombardy was 6.7 and Liguria and Piedmont with figures of 1.7 and 0.3 respectively had almost ceased to grow naturally. Birth rates in southern Italy remain high (Calabria 27.9:1000 in 1951 was the highest) in contrast with those in the north, illustrated by Lombardy 15.0, Piedmont 10.9, and Liguria 10.0. Whereas the population of southern Italy continues to increase naturally at a high rate, that in northern Italy is now increasing very slowly.[6] Problems of emigration from south to north which result are beyond the scope of this paper as also are the interesting contrasts in population structure considered by sex and age between various regions of the country. The important point is that over-all figures for the country mask very important regional differences, themselves the result of economic, social, and cultural contrasts, which present problems of acute difficulty to those responsible for planning the future economic life of Italy.

These considerations become of great importance when one considers the future rate of increase of the total population of the country. Forecasts of future population trends necessarily make many assumptions and are notoriously subject to wide margins of error. There has been, however, some support for the contention that the population of Italy may become stabilized in, say, about a quarter of a century. One recent and widely circulated estimate has postulated a stabilization at about 48–49 millions in the period 1965–70.[7] In F. W. Notestein's celebrated projections a maximum population of about 49.5 millions was to be attained about 1970. This estimate, however, assumed a continuance of interwar trends and made no allowance for wartime changes and as, indeed, Notestein was careful to observe, has only "a general predictive validity."[8] In view of recent changes in birth and death rates these estimates must be viewed with some care. The period 1920–1939 witnessed, for Italy as a whole, little appreciable narrowing of the gap between live birth and death rates. At the end of hostilities, however, a sharp rise in the birth rate resulted in a renewed widening of the gap and for a few years after the war the rate of increase remained comparatively high. Somogyi[9] has published interesting estimates for population growth up to 1971 based on the average annual rate of increase for 1946–9. These give a total of 58 millions by 1971 and postulate a continuance of growth for a further considerable period. Fortunately, it seems certain, and the 1951 figures support this contention, that the rate of increase of 1946–9 has not been maintained and the most recent figures

[5] Stefano Somogyi: "Prospettive del Potenziale Demografico delle Regioni," *Rivista Italiana di Economia, Demografia e Statistica*, Vol. 4, 1950, pp. 126–147.

[6] And would, in fact, assuming a continuance of present demographic trends and an absence of immigration from other regions, shortly commence to decline.

[7] *The Times*, November 10, 1950.

[8] Notestein, F. W.: "The Future Population of Europe and the Soviet Union," 1944, p. 290 et passim; and G. Frumkin: "Population Changes in Europe since 1939," 1951, pp. 17, 102–104.

[9] *Op. cit.*, p. 143.

suggest a declining rate of increase.[10] It seems reasonable to expect, therefore, that the total population of Italy will reach stability at some period within the next three decades.

In this connection, a question often asked concerns the remedies or palliatives which might be applied to stem further population growth and materially assist a long-term solution of the problem. Here one is confronted again by contrasts between northern and southern Italy. The population of Piedmont and Lombardy has already ceased to reproduce itself. The problem lies principally in checking the high natural rates of increase still obtaining in Calabria, Apulia, and other provinces of southern Italy. Restriction of the birth rate by the spreading of knowledge of birth control measures is often advocated as a palliative to the problem. It will be seen, though, that the need for knowledge of this sort lies in those regions of the country in which, for one reason or another, the spread of such information is likely to prove most difficult and where, in fact, it may expect to meet open hostility.

Certainly, some restriction of the birth rate in the provinces of southern Italy would seem, on many grounds, both prudent and expedient and would materially influence for the better the general economic position of the country as a whole as well as the average standard of living of her citizens. On this subject, social and religious considerations weigh as heavily as economic ones and it will not be easy to alter the climate of a large body of opinion which has declared itself hostile to the propagation of information on such matters. In any case, even if the practice of birth control were to become widespread immediately, this would have little remedial effect upon the immediate and urgent problem of surplus population, however beneficial its results might be 20 years from now.

But it is in the short-term aspects that the Italian population problem offers its most serious side and especially in the problem of chronic unemployment and widespread under-employment. The large increases in population totals since, say, 1881 have not been matched by a corresponding expansion in the number of available vacancies for employment. A fundamental lack of balance has appeared between the numbers seeking work and the number of available jobs. Lack of opportunity for employment not only occasioned emigration on a grand scale but also produced great increases in the total non-working as opposed to the working population. Between 1881 and 1936 a total increase of about 10.6 millions was recorded in the population of working age, but of these only about 2.8 millions found employment available.[11] The aggregate of the labor force in agriculture was roughly the same in 1936 as in 1881 (about 8.8 millions); industrial employment rose from 4.6 to 6.2 millions, other occupations from 2.1 to 3.3.

The present unemployment problem has been aggravated also by recent changes in the demographic structure of the population. A falling birth rate between wars, coupled with a decline in mortality rates, has resulted in a progressive aging of the general structure of population, a feature particularly evident in northern Italy. Large increases have recently taken place in the proportion of men and women of working age relative to the population as a

[10] It is of interest to note the general decline in calculated Reproduction Rates. The net Reproduction Rate 1921 was 1.37; 1931–5, 1.17; 1935–7, 1.131.

[11] U.N.R.R.A. Italian Mission. "Survey of Italy's Economy," 1947, p. 201. For 1951, employment figures were: agriculture 8 millions, industry 7, other occupations 4.4.

whole. A recent writer, in making this point, has suggested that, in recent years, annual increases in the total population of working age have been sizably greater than the annual increases in the total population of the country.[12] In 1936, each year of the 35–44 age group contained approximately 240,000 men, but in 1951 the comparable figure was over 360,000. In 1936, about 30.7 per cent of the population was over 40 years of age, in 1951 the corresponding figure was close to 35 per cent[13] (Fig. 1).

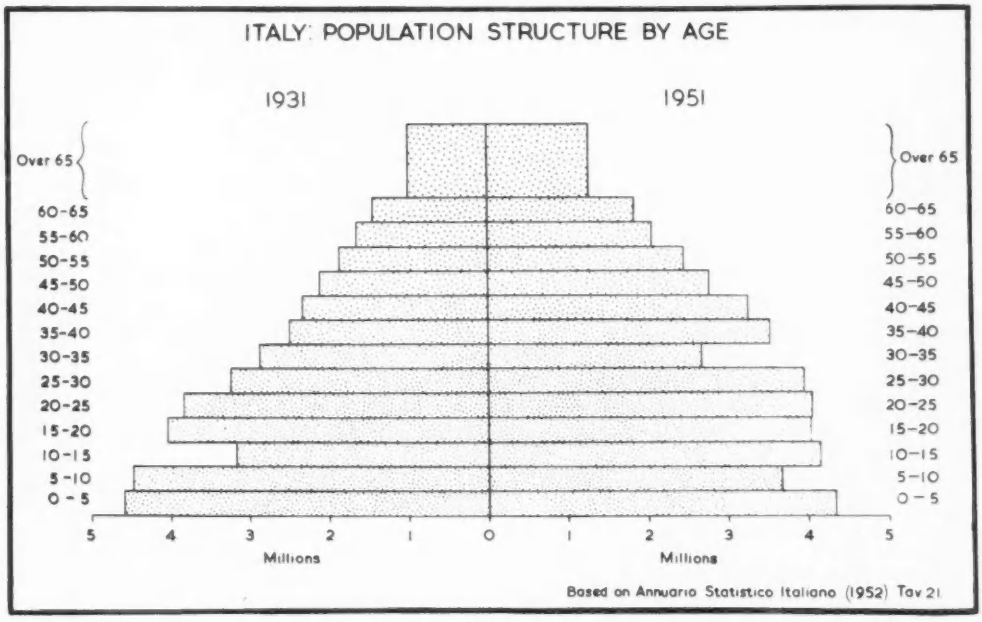


FIG. 1.

It is not easy to assess accurately the extent of unemployment at the present time. Official statistics recorded a monthly average of registered unemployed (all classes) of 1.86 millions for 1950 and 1.938 millions for 1951, with the highest incidence falling in the winter months. Elimination of certain minor classes of unemployment (e.g., workers in process of changing from one job to another), reduces the total to a net figure of a little over 1.7 millions for 1951. These statistics have been subjected to considerable criticism and there is no doubt that they are far from accurate. There are, however, considerable difficulties to be overcome in compiling unemployment records, arising from such conditions as the comparatively high proportion of independent craftsmen and self-employed persons and from the seasonal nature of much agricultural employment, as well as from defects inherent in the registration system. Furthermore, the problem of under or part-time employment of agricultural labor presents special problems. Some estimates place the general total of unemployment in the order of 2 million

[12] F. Coppola D'Anna: "Unemployment in Italy," *Review of Economic Conditions in Italy*, Vol. 3, 1949, p. 93.

[13] Vide also Somogyi. *Op. cit.* Tav. 7.: Occiuto, A. Considerazioni interno alla composizione della popolazioni per sesso e per eta e ad alcuni suoi effetti economica in *Rivista Italiana di Economia e Statistica*, Vol. 4, 1950, p. 106 *et seq.* This paper contains some interesting observations on the regional distribution of the labor force.

people.[14] Whatever the difficulties of the statistical problem, the fact remains that Italy with some 2 millions unemployed out of a total labor force of about 20 millions has a pressing and vital problem, of concern not only to herself but to members of the whole European community.

Some particular problems presented by this labor surplus will be discussed later, but it is only fair to say, at the outset, that there seems no immediate way of absorbing this surplus within the present economic capacity of the country. Though many plans for the development of agriculture and industry and for government investment have been propounded, their full effects will not be felt for a period. The chief and immediate answer, as many Italian writers cry, seems to lie only in the resumption (at least temporarily) of emigration on a much larger scale than at present.

Since the war there has been, in fact, some revival of the emigration movement. In 1947, almost 60,000 emigrants left Italy, in 1949 about 156,000, and in 1950 and 1951 about 140,000, though these figures are somewhat reduced in actual value by an immigrant movement of repatriates (in 1951, c. 41,000). Since the end of the recent war a number of emigration agreements have been concluded between the Italian government and the government of several European and non-European states, including, for example, Argentina, Brazil, and Australia, but the quota permitted entry into United States remains at a mere few thousand a year. Of particular interest are plans for the settlement of large numbers of Italian workers, craftsmen, and laborers in Latin American countries. In 1949, Argentina was by far the most important reception country, accepting some 98,000 immigrants, while Venezuela and Brazil received 14,000 and 7000 respectively. These positions were maintained in 1951, a year in which Argentina received about 55,000 and Venezuela and Brazil 12,700 and 8900 respectively. Emigration into North America has been restricted, particularly into the United States, which received just over 10,000 in 1951 compared with Canada's 21,000. Australia has been another important reception area and has maintained an intake of well over 10,000 since 1949, reaching 17,000 in 1951. Permanent migration to West European countries remains on a small scale and is almost balanced by the corresponding inflow of repatriates.

Emigration now takes place for the most part on an organized or controlled basis and there has been no return to the free emigration of pre-1920. In the case of recent attempts to settle Italian workers in Britain it has been clear that the question is clouded by the existence of popular prejudice, based no doubt on memories of the low standards of education and life of the old South Italian emigrants who formed the great majority of Italian overseas emigrants in the period before the first World War.

In view of present attempts to organize the economy of western Europe on an international basis it seems necessary that the problem of the existing surplus labor force in Italy should be fully reviewed on an international basis. It is doubtful whether action inside the country itself can meet the needs of the situation within a relatively short period of time.

[14] F. Coppola D'Anna, *op. cit.*, considers the official figures to be an underestimate and lays stress on the high incidence of hidden unemployment (among professional men, for example) and general under-employment. See also Cesare Vannutelli: "Unemployment Statistics in Italy," *Review of Economic Conditions in Italy*, Vol. 4, 1950, p. 287.

AGRICULTURE IN RELATION TO POPULATION

In attempting to seek a solution to the long-term problem of effecting a balance between the maintenance of an increased population at a higher and more equably distributed standard of living and the productive potential of the country, proposals have been put forward and some progress has been made in intensifying agricultural production and reorganizing industry.

From the agricultural standpoint, Italy is severely handicapped by natural conditions. It has been said that 39 per cent of the country is mountainous, 40 per cent hilly, and only 21 per cent plain. Almost one-half of the total area of the country (including Sicily and Sardinia) lies at over 300 meters above sea-level. The visitor to Italy knows well how, in many parts of the country, as, for example, in Tuscany, all but the very steepest slopes have been brought under cultivation in terraces. On the other hand unrestricted cutting of the former woodland cover has brought special problems, including that of soil erosion, to many areas in the Apennines, while not all the hill areas are as fully utilized as they might be, for Italy has suffered, paradoxically enough, from the well known movement of population away from upland areas to the plains and to the towns. Upland depopulation has but added to the general congestion of population in the restricted areas of more favored conditions while allowing large areas of marginal land to pass out of cultivation or from intensive to extensive use.[15] Nor are the plains of Italy always entirely suitable for intensive agricultural exploitation. Rich, highly fertile areas, such as those in the central and west central parts of the North Italian plain,[16] contrast markedly with areas of recent reclamation in the region of the delta of the River Po and the lagoon of Commachio. In peninsular Italy, many of the lowland areas have been but recently reclaimed from marshland and waste.

Again, climatic conditions make necessary the practice of irrigation over large areas of Italy, and although some areas, such as the "fontanili" zone in Lombardy and Piedmont, are well blessed, the seasonal nature of many Italian streams limits the amount of water available during the growing season, at the time when it is most needed.

The historical geography of agriculture in Italy is in large part the story of man's attempts to overcome these and other natural difficulties, to extend the area of available agricultural land and to improve its fertility. The process goes back to earliest times; reclamation was intensified in the Middle Ages and again during the last century and the most recent postwar proposals may be seen as the latest phases in this long continuing operation. During the present century a number of estimates have been made of the amount of land needing reclamation, and a recent one has put the figure at no less than 10 million hectares,[17] though this includes much land in southern Italy to be converted from extensive to intensive usage. A considerable setback to land reclamation schemes was provided by the recent wartime destruction of pumping stations and drainage works. As the writer can bear witness, many thousands of acres in the southeastern portion of the North Italian Plain, reclaimed with great labor

[15] See for example A. R. Toniolo: "Depopulation in the Mountains of Italy," *Geogr. Rev.*, Vol. 27, 1937, p. 473. Also, U. Giusti: "Lo Spopolamento Montana in Italia" (1938), reviewed in *Geogr. Journ.*, Vol. 93, 1939, pp. 527–529.

[16] Vide C. J. Robertson: "Agricultural Regions of the North Italian Plain," *Geogr. Rev.*, Vol. 28, 1938, pp. 573–596.

[17] Danio Perini, *Review of Economic Conditions in Italy*, Vol. 3, 1949, p. 509.

and difficulty during the past century, were quickly reduced to a state of submergence and waste and since the war have had to be reclaimed once more.

The importance of increasing the agricultural area by land reclamation has been recognized by postwar Italian governments. By 1947 much of the war damaged land had been restored and attention was devoted to new schemes in the lower Po Valley and in the more restricted areas of plain in peninsular Italy. An example of such a scheme is that for the lower Volturno Valley, where drainage and reclamation operations were put into progress in 1949 with the aid of funds provided by E.R.P. The reclamation program is supplemented by schemes for the prevention of soil erosion in many areas, particularly in the Apennines, and by the inauguration of both large and small scale schemes of irrigation works to which considerable attention is given in the recent so-called Fanfani plan for the agricultural development of Italy over the next decade.[18]

Despite the effort and capital invested in recent attempts to increase the country's agricultural area it is unfortunately true that a proportion of the existing acreage has been consistently underused over a long period of time. For this state of affairs responsibility may be attributed to the results of the land tenure situation as well as to the failure to upgrade the low status of many farms and apply more advanced techniques and equipment. The agitation for land redistribution in Italy arises from a situation in which as a recent survey (1948) showed[19] some 80 per cent of all Italian land holdings were under five acres in size while as little as 0.5 per cent of the landowners were owners of about one-third of the total area held as private property. In this respect conditions are particularly bad in Tuscany and Umbria as well as in southern Italy and the islands of Sicily and Sardinia. A recent survey of southern Italy has shown that the great majority of holdings were of under five acres but that 0.12 per cent of the landowners, controlling holdings of over 500 acres, covered some 32 per cent of the total area in private ownership. Standards of living in southern Italy compare, on the whole, very unfavorably with those in the center and north[20] and it is not surprising that pressure for land redistribution has been increasing for some time.[21] The characteristic large estate or "Latifondo" is not, under modern conditions, an efficient unit, combining as it does, low capital investment in the land with extensive practices and the maintenance of a comparatively small population. Furthermore the presence of large holdings of land in private hands has been a factor militating against the development of an efficient peasant farming economy.[22]

Shortly after the war, seizure of land by peasants was a feature in some areas, particularly in southern Italy, but the government has now embarked upon a program of land redistribution and capital investment in an attempt to

[18] *Review of Economic Conditions in Italy*, Vol. 6, 1952, p. 30.

[19] Reviewed in *Foreign Agriculture*, October, 1949.

[20] For details, see Associazione per lo Sviluppo Industriale del Mezzogiorno, "Survey of the Southern Italian Economy," 1950.

[21] Equally acute problems though of a rather different nature may be found in regions in N. Italy, for example, in Emilia, where the problem of the "braccianti" has long been acute. A recent study of the Cento district of Emilia has estimated its maximum potential density of population at 275 per sq. km., while present actual density is of the order of 475. See Mario Ortolani, "Un Territorio Sovrapopulato," *Rivista Geografia Italiana*, Vol. 57, 1950, pp. 210–222.

[22] A short account of these and related problems of agriculture will be found in Giuseppe Medici, "Italy: Agricultural Aspects," published in 1950 on the occasion of the VIIth International Conference of Agricultural Economists.

improve the status of farming. Recent enactments have provided a starting point for the reduction of large holdings in certain areas, for example, Puglia, Lucania, and Calabria in southern Italy and Ferrara in the plain of the north. A particularly important scheme for the Sila area of Calabria, in the toe of peninsular Italy, was begun in May, 1950, when expropriation measures for some 16,000 out of 65,000 hectares owned by three of the largest "latifundisti" of southern Italy were approved.[23] Similar progress is being made in Sicily. An important scheme of land reclamation and improvement is now in progress in the Maremma which up to a century ago was highly malarial and largely unreclaimed. Here agricultural methods are being intensified and new types of seeds and breeds introduced. The large estate was formerly dominant in this area and over one-half (52.9 per cent) of the area was held in estates of over 500 hectares with farm workers finding an average annual employment of 145 days. Plans for expropriation of parts of the larger holdings and their subdivision into small farm units are in hand and schemes for land reclamation and irrigation are also being put into effect.[24] Expropriation of large holdings remains only a part of the problem, for the consolidation of peasant holdings, which are often widely scattered in many small parcels, remains equally desirable. Furthermore, investment in new buildings and farm equipment is an essential element in any scheme aimed at reorganizing land distribution, and funds for this purpose will become available under Italian government schemes.

Quite apart from increasing the acreage of agricultural land and adjusting the pattern of land tenure, where this is necessary, much can be done to increase agricultural output by improving the efficiency of farming methods. Under postwar U.N.R.R.A. and E.R.P. schemes, considerable aid has been given in improving seeds and equipment and in pest control. Home production of agricultural chemicals and artificial fertilizers has been increased as also has the output of motor tractors designed for use under the varied local conditions of soil and climate. Doubts have been expressed in Italy regarding the general applicability of an intensive mechanization policy in view of the existing surplus of manpower and the possible danger of increasing rural unemployment. The prime objective must be, however, to raise the yield of land under cultivation by improvement of soil conditions and improved management and by a close study of cropping and livestock programs in the light of local and regional physical and economic conditions. Conditions differ so widely as between mountain, plateau, and plain, and between north, center, and south that it is well nigh impossible to make generalizations regarding Italy as a whole; on the other hand it is imperative to develop agricultural production as quickly as possible in the light of local conditions. In this respect the failures and drawbacks of the prewar policy of a general increase in cereal production, the "battaglia del grano," are well known.

When all this has been said, however, it is difficult to see how the development of agriculture alone can do more than absorb a fraction of the present surplus labor force though it can undoubtedly make a contribution to the long term solution of the problem. But in view of the existing complicated pattern of land tenure and particularly, in southern Italy, of the low standard of education

[23] *Foreign Agriculture*, November, 1950, p. 244.
[24] "Vide Land Reform in the Maremma," Ministry of Agriculture and Forestry, Rome, 1952.

of the peasantry and of the inadequate techniques often employed, it would be unwise to look for spectacular results.

PROGRESS OF INDUSTRIAL DEVELOPMENT

Despite certain natural handicaps, Italy has made remarkable progress in developing industry during the last 75 years, and prior to 1939 industry succeeded in absorbing each year a noteworthy proportion of the population surplus. The country, as is well known, suffers from a notorious shortage of raw materials; estimates declare that, in 1938, imports of raw materials, including fuel, for industry accounted for 48 per cent by value of the country's total imports. If semi-finished products imported for further processing and assembly be added then the proportion rose to some 70 per cent.[25] Italy's coal resources are not high. The production of lignite has fallen in recent years and is now of the order of 850,000 tons a year (1951) of black and Xiloid lignites, but their high moisture and ash content reduces the effective value by a further third. There is a small production of anthracite, but the main supply of coal comes from the mines of the Sulcis Basin in Sardinia which produced 1,070,830 tons in 1951. Some development work has been planned here since the recent war. Italy depends, however, on the import of coal (8.5 M. tons in 1950, and almost 11 M. tons in 1951) chiefly from the United States, Germany, and Poland.

As far as other minerals are concerned, Italy has a noteworthy production of iron ore, sulphur, mercury, zinc, lead, pyrites, and bauxite. Home production of iron ore has been, in recent years, of the order of half a million tons a year and is smelted locally, but large imports of iron ore and scrap are necessary to supply the demands of the steel industry. Italy remains an important producer of sulphur, though the annual production has been reduced by more than a half since the beginning of the century, when Italy was the leading world producer. In view of the world demand for sulphur it seems probable that the 1950 production of 213,000 metric tons may be increased. Sicily remains the chief source, though other producing areas exist in Romagna, Marche and Campania. Production of zinc (of variable quality) is now at about 200,000 tons a year, lead 64,000, mercury, of which Italy is an important world producer, at 175,000 tons, and bauxite at about the same figure. In 1952 bauxite production was notably increased to 280,000 tons. Possession of these minerals can in no way make up for the shortage of coal and iron ore, and the country is self-sufficient only in sulphur, mercury, and zinc.

To some extent, however, the fuel shortage is redeemed by the availability of water power resources for hydro-electricity, though even here the potential is not as great as it may seem, due to the seasonal flow of many Italian streams, particularly in the Apennines. However, considerable activity has been shown since the war in repairing the heavy war damage and in developing a network of hydro and thermal-electric stations. Of the estimated 1951 output of 29,223 million kwh over seven-eighths was hydro-electrically generated, three-quarters of it in northern Italy, and plans are in hand for a further increase in total production to 35,000 million kwh in the next few years. The opening at Genoa in February, 1952, of the largest thermal electric plant in Italy, a plant which can be worked by coal, oil, or natural gas, suggests that progress in this direction is being made. A further minor re-

[25] U.N.R.R.A. Survey, *op. cit.*, p. 65.

source, the natural steam supplies at Larderello in Tuscany, are being further developed to generate thermal electricity and as a raw material for chemical industries.[26] Of great significance has been the notable development of natural gas production in the Po Valley. The prewar production of 10–15 million cubic meters a year was increased by 1948 to 117 millions, by 1950 to just over 500 millions, and in 1951 to 976,590,000 cu. meters. Since this production is said to be the equivalent of more than 1 million tons of good quality coal the significance of such a fuel supply will be immediately apparent. The principal centers of production lie in the Po Valley, in particular around Cortemaggiore, and further prospecting and development work is in progress. Further exploration may reveal the presence of natural gas in quantity in peninsular Italy also. Three main pipeline networks carry methane to the major industrial centers of Lombardy and Piedmont, to the eastern plain and to Venetia, and to Bologna and Florence. The development of the natural gas resources will prove, without question, a factor of major importance in increasing the industrial potential of Italy.[27]

Quite apart from a shortage of raw materials, Italian industry suffers from other disadvantages. Among these is the well known lack of balance in industrial distribution as between North and South. Establishments in the Northern Plain employ approximately 70 per cent of the industrially employed and though schemes are mooted for the promotion of light industries as a part solution to the problems of over-population and low standards of living in southern Italy, these are not likely to go far in redressing the balance.

It is also worth considering how far the labor surplus can be considered an industrial asset. One is familiar with statements of alleged industrial location factors and advantages which end by including "ample supplies of cheap labor" as an important competitive advantage. These no doubt contain some truth, but it should be realized that a labor surplus can have the opposite effect, and, indeed, the high costs of production in certain Italian industries are said to have the labor surplus as a basic cause. Certainly, this situation has acted as a deterrent to modernization of production methods and re-equipment with modern machinery. In view of the high level of unemployment many firms are forced to retain redundant workers, while it has been claimed that the high costs of social insurance due to the prevalence of unemployment and to certain features of the Italian social insurance system are also reflected to an effective extent in high costs of production.[28] Whether or not this is so, it is certain that the so-called "existing pool of cheap labor" is by no means an unqualified industrial asset, and, in view of the present high level of unemployment, it can, in fact, act as a brake to the speedy increase of industrial production. The further development of the home market for industrial goods, a factor of great importance to the future growth of Italy's manufacturing economy, is itself dependent, in part, on a solution to the unemployment problem and a general increase in the over-all standards of living.

[26] P. G. Conti: "The Natural Steam Power Plant of Larderello," Florence, 1924, and *Review of Economic Conditions in Italy*, VI (1952), p. 48.

[27] Bruno Nice: "Lo Sfruttamento del Metano in Italia," *L'Universo*, XXX (1950), pp. 493–504; Giuseppe Stellingwerf, "Gas Metaniferi considerati del punto di vista della difesa della nazioni," *L'Universo*, XXXI (1951), pp. 213–222. 1952 output is estimated at 1,434,645 cu. m.

[28] See, for example, U. K. Board of Trade Overseas Economic Surveys: Italy, 1951, p. 54. Also, Cesare Vannutelli: "Wage Structure and the Cost of Labour in Italy," *Review of Economic Conditions in Italy*, Vol. 6, 1952, pp. 385–407.

In Lombardy, Piedmont, Liguria, and Venetia, the country possesses a number of plants of high technical efficiency and with good standards of management. In almost all branches of industry, in engineering, textiles, metallurgical and chemical manufactures, plans for redevelopment have been advanced and are in process of being put into force, often with the aid of loans from the European Recovery Programme and other external sources. Space precludes a detailed discussion of these, but mention might be made of the so-called Senigallia plan for the iron and steel industry. This has involved the construction of a new steel plant with modern strip mills at Cornigliano, near Genoa, and the concentration of production at a small number of comparatively large-scale modern plants, now under reconstruction, with the object of reducing the costs of Italian steel to an internationally competitive level. The three principal integrated plants are at Cornigliano, Bagnoli (Campania), and Piombino (Tuscany). It should be remembered that Italy is in a not unfavorable position with regard to the supply of the relatively expensive ore from Tunisian and Algerian sources which provide some four-fifths of her needs, though in comparison with other West European countries production costs are high. Plans of similar scope for increasing production in other industries, for example, the cotton and artificial textile and mechanical industries are being developed.

The rapid expansion of production is, however, also restricted by some characteristics of the Italian industrial structure. In 1938, of an industrially employed population of 4.4 million, only 19.3 per cent were employed in establishments of over 1000 personnel and a total of 43 per cent in establishments of over 100. Small factories were very numerous and about one-third of the industrial labor force (representing about 1½ million workers) were individual craftsmen or employed in workshops of under five employees.[29] In these circumstances the rapid increase of output and lowering of costs may not be easy to achieve by the single expedient of introducing modern techniques of "flow" production.

Before the war, industry contributed about one-third of the national income of Italy. While the total of agricultural manpower remained stationary, the problem of the annual surplus population had been partially solved by absorption in industry. The future prosperity of the country may seem to depend very largely on the continuance of the rate of industrialization and the future capacity of industry to absorb the annual increase in working population as well as to make an effective contribution to the improvement of over-all standards of living.

Fortunately, the shortage of coal will be, at any rate in part, lessened when the present programs of hydroelectric development and natural gas exploitation are complete. The disadvantage of inadequate raw materials is to some extent minimized by the relatively favorable location of the main industrial centers (either on the seaboard, as in Liguria and Venetia, or at the meeting place of main road and rail routes as in Lombardy) for the assembly of raw and semi-finished raw materials for further processing. Given the further provision of adequate capital backing there seems little doubt that a further important expansion of the industrial economy can be achieved.

CONCLUSION

The themes which underlie this review are plain. Firstly, the problem of

[29] U.N.R.R.A. Survey, *op. cit.*, pp. 69 and 695.

surplus population touches almost every aspect of the social and economic life of Italy. Secondly, the political and economic manifestations of the problem are such as to affect in an important degree plans for the reorganization, not only of the Italian, but of the Western European economy; the problem is thus, in a sense, not only national but international. The short term aspects of the question, of providing employment in Italy, as well as abroad, for the present surplus of population within the working ages appear to be an overriding consideration. Long term capital investment and reorganization in agriculture and industry may do much to solve the ultimate problem. The seriousness of the situation has been mitigated greatly by financial assistance from U.N.R.R.A. and E.R.P. during the last few years. On the other hand, recent reactions in Britain to attempts to introduce Italian labor are perhaps indicative of a public lack of awareness of the nature of the immediate problem and of the serious political consequences which might conceivably result from a failure to attack quickly the present unemployment situation.[30] At heart the fundamentals of the problem are essentially geographical and reflect the lack of balance between the number and structure of the population, the natural resources, and the productive capacity.

[30] On this point see Ugo la Malfa: "Touch-and-go in Italy," *Foreign Affairs*, Vol. 31, No. 2, January, 1953, pp. 257–267. The results of the Italian elections of June, 1953, further emphasize the delicate political situation of the country and the extent to which this is influenced by economic and social considerations.

LAND REFORM IN SOUTHERN ITALY

Robert E. Dickinson

Dr. Dickinson, Professor of Geography at Syracuse University, spent the year 1951–1952 in field work in Italy on grants from the Social Science Research Council and the Office of Naval Research. This article presents one aspect of his findings.

IN 1950 the Italian government launched a tremendous program for the improvement of living conditions in the notoriously depressed areas of the southern provinces. In this paper we shall portray the progress of land reform that constitutes more than a quarter of the total financial outlay of this ten-year plan.

The Background: Land Reclamation and Peasant Settlement

In the first place, we must examine the background on which the land reform work is functioning. The ten-year plan, which is being planned and organized by a special government authority known as the *Cassa per il Mezzogiorno*, is to involve a sum of about two billion dollars. Almost all of this is to be devoted to irrigation and land transformation, mountain conservation and afforestation, agrarian reform, road construction, and the provision of public water supply. The jurisdiction of the *Cassa* extends over 112 reclamation districts (*comprensori di bonifica*), covering 4 million hectares, and 235 mountain basins, covering 4.2 million hectares. At the end of the decade, 2 million hectares will be improved (*bonificati*) and 1.6 million hectares will be afforested. About 360,000 hectares will be irrigated and over 500,000 hectares in bush crops. It was estimated at the outset that the whole program will increase the agricultural yield of 3.5 million hectares threefold and increase labor consumption from 20 to 40 work days per hectare to 80–120 work days per hectare—i.e. about one million man-units. A more recent statement envisages the employment of 360,000 additional man-units in agriculture.

The reclamation districts noted above are associations of proprietors in specific areas, formed in accordance with the law of integral land reclamation of 1933. These associations are responsible for the preparation and execution of plans of regional development, the costs of which are carried partly by a levy on the proprietors, but mainly (over 87 per cent) by the State. Once a district is formed, it is incumbent on all proprietor-members to carry out its prescribed reforms. Such organizations cover a large part of Italy and in 1948 the government decided to concentrate on those that offered the best prospect of speedy completion and substantial returns towards the solution of the country's economic and demographic problem. These selected districts fall into three categories (Fig. 1). The so-called "acceleration districts," that are first priority, are those in which only 30 to 50 per cent of the works had been carried out in 1948. They offered the main possibilities of increased production and labor absorption. With the

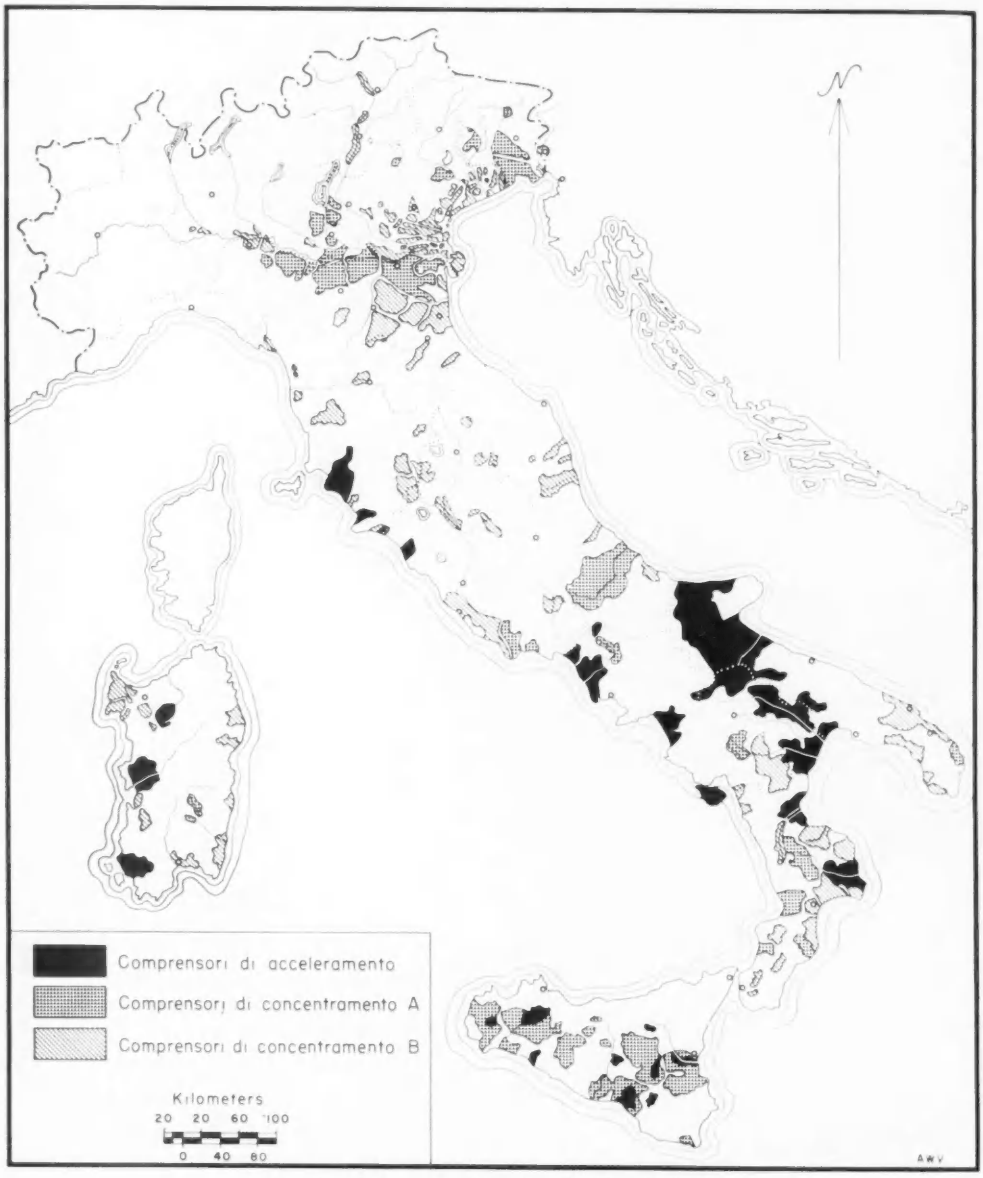


FIG. 1. Selected reclamation districts in Italy.

exception of the Maremma, all these are in the South. The main areas extend from the Tavoliere to the Metaponto. In addition, such works are being completed in the Sele valley of Campania and in the Sibari and Neto plains in northern Calabria. The projects in the second and third categories were those in which 50 to 70 per cent of the work had been carried out in 1948; they should be completed within the four year period. The chief in the south is the Sila Plateau area in northern Calabria. Other areas include the group on the Ionian litoral of Calabria, the Agri basin, an area around Brindisi, the lower Volturno and Guarigliano valleys, and several valleys on the Adriatic coast

of the Abruzzi and Molise. It is reckoned that about 160,000 hectares will be irrigated in Puglia and 40,000 hectares in Lucania, the chief areas being the Tavoliere, the Ofanto valley, and the Metaponto. It is within this broad framework that the land reform program must be specifically appraised in both its objectives and prospective results.

The general aim of the ten-year plan is to increase production and the absorption of labor and improve the living conditions of the peasantry. A fundamental change in the working relationships between the cultivator and the soil is necessary to achieve this. This is not a new aim. It has checkered the history of the South for over a hundred years, though efforts have not been very successful. The concentration of peasant cultivators in villages, far removed from their scattered strips of land, to which they often have complex and temporary tenures, is a reflection of the social structure of the South. Various attempts have been made to break down this structure and give the peasant a more secure hold on a compact holding. There are quite considerable areas of dispersed settlement. The most remarkable of these is in the south of the Murge, a dry limestone plateau southeast of Bari. During the last hundred years the peasants have laboriously cleared the red soil of its stones, built neat stone walls around minute fields, and erected houses with quaint conical roofs (the famous *trulli*). They collected their water in cisterns from the winter rains, though much of the area now draws its water from the Puglian Aqueduct. They grow wheat (and some fodder) that depend on the winter rains, and olives, vines, and almonds, that bear their fruit during the drought of summer. This was made possible, and worthwhile for the peasant, by the grant of such holdings on permanent tenures by large land owners, provided that the peasant made improvements on them (emphyteusis). This demonstrates what the peasant can do once he has adequate land on which he can stay put without fear of eviction.

The creation of small peasant holdings, on which dispersed farms have sometimes been constructed, has taken place in various ways. The legislation of Giuseppe Buonaparte in 1806 abolished feudalism. The State later appropriated and sold the enormous properties of the church, and established full ownership to those vast areas of land to which either the feudal lords or the people had vague rights of usage. Large areas passed into the private hands of the existing feudal owners, while large areas, especially those of the church, were sold to such owners, and especially to the townsmen who had the cash and desired to enjoy the social prestige associated with land ownership. Large areas were allocated to the communes as public property for communal use or for subdivision among the peasantry. Such subdivisions, referred to as *quotizazzione*, took place mainly in the last decades of the 19th century and have continued since. But the quotas were rarely more than two hectares in extent. They were too small to support a family in food or work, and, without capital or guidance, the peasant simply cultivated in the primitive fashion to which he was accustomed. Also, poverty and debt often caused him to sell his plot to the highest bidder, even though such transactions were forbidden. While there are cases in which the peasants made good on such holdings and improved their farming, by and large the method failed to establish a self-sustaining class of peasant farmers, which was the objective of the theorists. Several hundred thousand hectares have

been subdivided in this way in the South. Then again, much land changed hands during the period 1880 to 1914, through the dollar earnings that reached Italy from her emigrants. This contributed to the spread of the intensive cultivation of vines and olives and other tree crops, as, for example, on the Murge plateau. A similar phase took place in the twenties, when foreign currencies and the war time savings of the peasants accounted for one million hectares passing into the hands of small owners in all Italy, including some 250,000 hectares in the South. There are also cases of more enlightened landowners developing their land on the system of the "classical mezzadria" of central Italy—establishing carefully chosen peasants on holdings on a fifty-fifty basis. Finally, the *Opera Nazionale dei Combattenti*—the War Veterans Organization of World War I—was able to expropriate and develop land between

FIG. 2 (upper left). Dispersed farms (*trulli*) on compact holdings with small walled fields, and an economy devoted to wheat, vines, and olives. This land was cleared and settled in the latter half of the 19th century and illustrates what the peasant can do on a farm in the open country, given security of tenure and a holding big enough to support his family. Location: Alberobello in the southern Murge.

FIG. 3 (upper right). Planting potatoes on the Sila Plateau in mid-May. These are small *quote* assigned to the peasants from San Giovanni di Fiore several miles away. The whole area was first plowed by tractors and then the potatoes distributed to the peasants for planting.

FIG. 4 (lower left). General view of Santa Severina in the Hill Zone on east of the Sila Plateau (see SS on Fig. 8). This was the first village in which the principles of land settlement were worked out. Not enough land was available to go to all the needy, and even the new *quote* are inadequate fully to support the peasant families.

FIG. 5 (lower right). Clearance and plowing of expropriated land prior to assignment to peasants. Location: Carovigno, near Brindisi. This low-lying limestone land, used for centuries as rough sheep pasture, is being cleared of stones, and then plowed to a depth of one meter. Fiat caterpillar tractors are used for the purpose, and then the stones are dislodged and collected by gangs of peasant laborers. This land is to be divided into holdings of 1 to 4 hectares.

the wars. There are several small areas in the south, of which that in the Tavoliere may be mentioned, where dispersed holdings of 20 to 30 hectares were formed in the thirties.

In these various ways, land has passed slowly into the hands of small peasant owners, and many have built farm houses on their holdings. Thus it has been said: "Of the 1.5 million hectares occupied by specialised crops in the Mezzogiorno and the Islands, it can be said that a little less than one million have been recently planted. None were planted earlier than the second half of the 18th century, but most date from the second half of the 19th century."[1] These trends, however, only scrape the surface of the problem, though they are indicators of what has been and can be done. The problem is so vast that it clearly needs help beyond that of the individual enlightened landowner or of the district association of owners, or of the enterprise of the individual peasant. The substantial and continued aid and guidance of the State seem to be essential.

THE CURRENT PROGRAM OF LAND REFORM

The question of land reform has long been debated in Italy with the object of expropriating large underdeveloped properties and creating smaller compact farm units. A bill was finally placed before Parliament in April, 1950, applicable to the whole of Italy. This, however, was hedged with difficulties and has not yet become law. The objective, be it noted, is not one of ruthlessly expropriating all large property owners. In fact, large properties cover the biggest area in central Italy, but here they are usually organized as effective economic units by the practise of the *mezzadria* system, that developed in the 17th and 18th centuries. Such a property is divided into compact farm units (*podere*) and the share-tenant or *mezzadro* (who enjoys real permanence of tenure) takes his products and draws his supplies, etc., from the center of the property, the *fattoria*, on an agreed share basis between landlord and tenant. Moreover, there are many efficiently organized large properties in the Po basin, that are at one and the same time economic operating units on a "capitalistic" basis, that is, they depend on hired labor. Changes in land tenure and agricultural contracts will undoubtedly have to be made in these areas, but the principle problem lies in the vast properties of the South that have been simply used by the owners as a source of unearned income. It is largely because of the regional diversity of these conditions that it is so difficult to legislate uniformly for the whole. In the initial bill it was calculated that 1.4 million hectares would be expropriated, of which nearly one-half would be in the southern compartments and the two islands, Puglia and Sicily being the giant contributors. The total agricultural area in Italy is 28 million hectares so that the proportion of land involved in the legislation is small. The changes in land ownership would have repercussions on the "real estate market," and it was reckoned that in ten years probably a total of 2.5 million hectares would pass into peasant ownership. Lest it be thought that grave injustices may be done in such legislation, it should be recalled that under these proposals, and in laws now actually in force, holdings of up to about 750 acres remain intact.

There was widespread social discontent among the peasantry in the years following the war. It must be empha-

[1] "Rapporto della Commissione Economica, presentato all' Assemblea Costituente, I. Agricoltura: 1. Relazione," Roma, 1947, p. 333.

sized that this is no new phenomenon in Italian agrarian history. Such discontent—rioting and unlawful appropriation of land—has checkered Italian history for nearly a hundred years. Such disturbances occurred in the same areas of acute distress, notably in Emilia and Puglia, after World War I. But in the late forties this was coupled with the spread of Communism as well as by public concern, on both economic and moral grounds, for the relief of the poverty of the South. Hence resulted the special laws that were speedily passed for legislation in these special areas, while the general law for the whole country has been shelved.

The first step was taken in May, 1950, when the government legislated for northern Calabria. In October 1950 legislation was extended to specific depressed areas, in which the poverty and discontent of a numerous landless peasantry could immediately and locally be relieved by land reform legislation. New Authorities or *Ente* have been created to carry out the program of land reform. They must expropriate the land, settle and develop it, and provide permanent technical assistance to the new peasant proprietors. Expropriation is based on value rather than size of properties. It begins with properties—and these must be clearly distinguished from operating units—with a total assessed taxable value of over 30,000 pre-war lire; and the percentage of the property to be expropriated is inversely proportional to the productive value of the land per hectare. The Sila area in Calabria was exceptional in that the land of all properties greater than 300 hectares was expropriated if capable of "further development." In the assignment of this land to the peasants, several basic principles are being followed. Priority is given to the landless laborers and then to the peasants with holdings inadequate to support them. Selection is based on need, not ability. Next, peasants are settled within the boundaries of the commune in which they live when there is expropriable land within it. This means that there is sometimes not enough land to go round and some families are being shifted to other areas; so far these families are few. Finally, holdings are kept at a minimum size, but production must support a family, in both income and labor, at acceptable Italian living standards.

LAND REFORM AREAS

Figure 6 shows the extent of the land reform areas. Most of them are in the South. All of them have three characteristics in common—the extensive cultivation of sown crops with a very low input and output per hectare; the concentration of property in the hands of a few absentee landowners (*latifundista*) who have thus a virtual monopoly of the land market; and large numbers of landless agricultural laborers, who suffer from long periods of underemployment or chronic unemployment. It is this association of socio-economic conditions in these specific areas that the land reform program seeks to rectify by a more equitable distribution of the land and a great increase of production and labor absorption. The two main areas in the South are in northern Calabria, operated by the Sila Authority, grouped around the high plateau of that name, and the land astride Puglia and Lucania. Smaller areas with similar agrarian structure to these two are the Volturno and Sele valleys and the coastal areas of the Lecce peninsula in the heel. It should be noted that these areas also include the irrigation projects that have been speeded up with E.R.P. funds to contribute to the same end.

Table I shows the progress of expro-

FIG. 6.

priation and assignment in all areas as of July, 1952. Some 700,000 hectares are involved in all of Italy. About 300,000 are in the southern mainland and 100,000 in Sicily and Sardinia. The greatest work is being done in the area of the Sila Authority in northern Calabria, Puglia-Lucania, and Maremma. We shall confine our attention here to the first two areas. In the area of the Sila Authority 90 per cent of the total expropriable land has been legally expropriated and more than half of this assigned to a total of nearly 10,000 families with an overall average of 4.3 hectares each. The Puglia-Lucania Authority, that was created in February, 1951, has an expropriated area of 200,000 hectares, nearly a third of the gross total, and 15,000 hectares had been assigned to 3000 families. By December, 1952, over 30,000 hectares had been assigned to 6000 families and 2000 houses were under construction. The average size of the holding is five hectares.

THE AREA OF THE SILA AUTHORITY

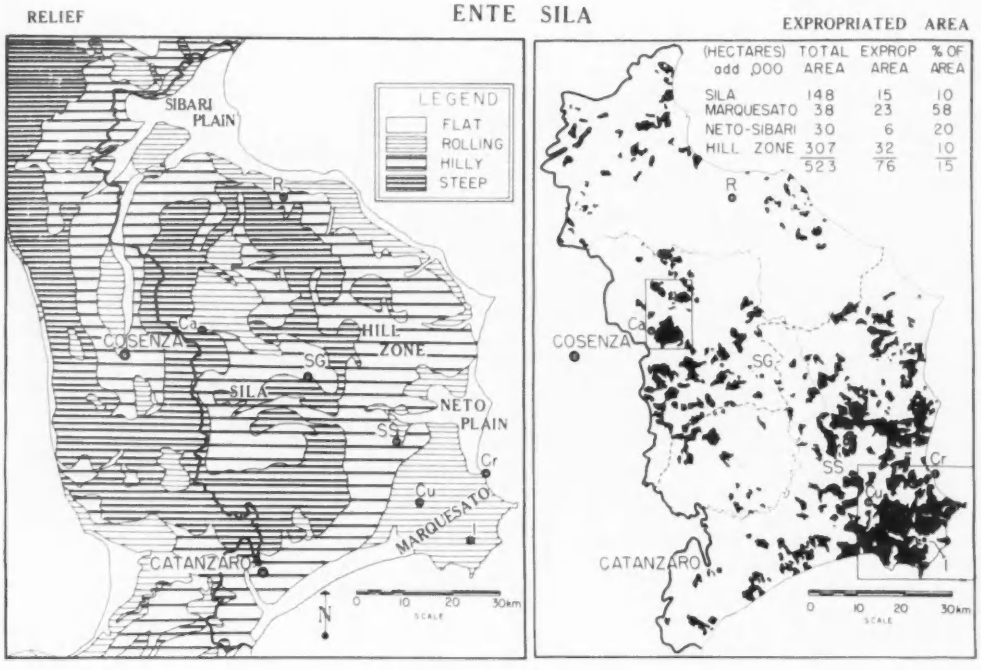
Let us first examine the area of the Sila Authority (Figs. 7 and 8). This includes the area of the high Sila Plateau, that was established as an authority for regional development in 1947. To this were added the bordering hills and plains of the so-called Ionian territories in 1950. This was the area of greatest urgency, in which the principles of the land reform were worked out. It also illustrates the different conditions that are to be met with throughout the South. In Figure 7 are shown the four major sections, the high Sila Plateau, the Hill Zone, the Marquesato Lowland, and the Neto and Sibari Plains. Each of these has distinct problems of land settlement which we shall briefly describe.

TABLE I

PROGRESS OF LAND REFORM IN ITALY, JULY 1952

(Areas in 000's Hectares)

	Total	*Po Delta*	*Maremma-Fucino*	*Campania*	*Puglia Lucania*	*Sila*	*Sicily*	*Sardinia*
Total to be Expropriated....	710,500	62,569	237,659	10,381	208,572	81,103	34,924	75,312
(Areas in Hectares).....	100	8.8	31.4	1.5	29.4	17.4	4.9	10.6
Authorized Expropriations...	254,100	2,500	78,006	3,000	74,000	73,000	7,100	16,500
% Total.....	35.8	4.0	32.8	28.9	35.5	90.0	20.3	21.9
Land Assigned to Peasants...	72,000	.....	16,500	.....	15,000	40,500	.....	.....
% Total.....	10.1	.....	6.9	.....	7.2	49.9	.....	.....
% Authorized.....	28.3	.....	21.1	.....	20.3	55.5	.....	.....
Number of Families.....	16,000	.....	3,500	.....	3,000	9,500	.....	.....
Hectares Per Family.....	4.5	.....	4.7	.....	5.0	4.3	.....	.....



FIGS. 7 and 8.

On the right (Fig. 8) the expropriated areas are shown in black. It will be noted that they occur as scattered fragments of land, except for the Marquesato in the southeast. Table II shows the progress of expropriation and assignment in each section.

1. The Sila Plateau

The Sila is a granitic plateau 1000 to 1500 meters high, with an extremely deeply dissected peripheral zone (500–1000 meters). It is snow covered for some three months. A maximum precipitation of over 60 inches decreases to the margin of the plateau, a minimum of under 40 inches occurring in the east-center. Rains in November–December are followed by abundant snows and a secondary rain maximum in spring, when rain is especially frequent from the end of March to the middle of May. One-third of the area is covered with pine and beech forest, and considerable areas of rolling or hilly land in the center of the plateau have good pasture. Cultivated land is sporadically distributed over one-sixth of the area, though the chief compact areas are to be found on the periphery of the plateau, especially around San Giovanni in Fiore, where the land is divided into minute strips. Three of the flatter sections in the center of the plateau are now occupied by lakes—two formed in the 'thirties and the third in the spring of 1952—that are designed for the provision of electricity in the South. Some 30 communes divide up the plateau and the villages are situated on the deeply dissected periphery, at altitudes between 500 and 1000 meters, in the midst of the characteristic zone of chestnut woods. Each commune stretches from the village up to the plateau and down to the lower land, where the peasant cultivates the vine and the olive. All told there are about 160,000 people in these communes, and about 14,000 families of cultivators.

The border villages have many peasant cultivators with minutely subdivided lands. The local artisans and migrant laborers have suffered from loss of work in recent years. In spite of such economic pressures, the high plateau remains underdeveloped. It has long been owned by a few large absentee proprietors. They sublet the land to tenants (*industriali*)—the customary procedure in the South, and notoriously so in Sicily. These men bring up their sheep (8000) and cattle (6000) from the plains in June to pasture through the summer, or they cultivate the land with the aid of laborers (*braccianti*) from the villages. Some of their land they rent in scraps on insecure short period tenures to the peasants (*terrageri*) from the surrounding villages. The rotation on the poor land is rye and pasture, or on better irrigated land potatoes—rye—pasture. The peasants come up to the plateau for three or four days in April, when they plant potatoes, they then return to the village, come back to cut hay in May or June, harvest their rye and irrigate their potatoes in July–August, and finally return in September to harvest their potatoes and their rye. The peasant does not stay on the plateau for more than about 14 days altogether. The rye remains in the ground for the incredibly long period of one year. The pastures are inadequately utilized. The good growth in May is often not used, since stock do not arrive here till June. In fact, it is a common practise to cut hay in May and carry it down to the lower lands. In the spring, cultivators, shepherds, charcoal burners, *braccianti*, caterers, and holiday makers come up in that order. All leave the plateau from September to November in the reverse order. The plateau is almost completely deserted in winter, carrying no more than a few hundred residents. It supports about 10,000 in the summer and could probably carry permanently well over 50,000. The peasant's aversion to the cold and his preference for the squalor of the village are main difficulties in getting him to live on the plateau. This is a remarkable instance of the inadequate utilization of a sub-Alpine area owing to the prevalence of accepted ways of living.

TABLE II

EXPROPRIATED AREAS IN NORTHERN CALABRIA

JULY, 1952

Zone	*Total Area (Hectares)*	*Expropriated Area (Hectares)*	*% Expropriated Area to Total Area*	*% of Total Expropriated*
Sila Plateau	148,000	15,000	10	20
Marquesato	38,000	22,000	58	30
Neto-Sibari Plains	30,000	6,000	20	8
Hill Zone	307,000	32,000	10	42
Total	523,000	75,000	15	100

Some 15,000 hectares of land are expropriated (all properties with over 300 hectares), most of it now divided among 3300 families. This expropriated land, it needs to be emphasized, is only about a third or a quarter of the land that can be agriculturally improved. The rest remains in the hands of the large proprietors and they are legally obliged (on pain of further expropriation) to carry out agrarian improvements, for the Sila area is ranked as a reclama-

tion district as defined above. There is great scope here for the development of smaller tenant holdings with a mixed farming of the sub-Alpine type. This is the line the Authority is pursuing. The program is being organized from two main centers at either end of the main road (and the new railroad now approaching completion)—Camigliatello and San Giovanni in Fiore. Camigliatello is a small resort located at the terminus of a railroad from Cosenza. It is the entrance to the Sila. In this area, enclosed by the rectangle on Figure 8, is situated one of the reform sectors. This is shown on the Figure 9, which indicates how the land is being settled. The lake (Mucone) was formed in 1952 above a new barrage that is to provide electricity. Around it are the scattered fragments of expropriated land.

Each of these fragments is first evaluated as to productivity by dividing up the area into minute terrain units and giving to each so many points. (This is an old established procedure in Italy for land tax purposes). Each section is divided into natural (physical) units or *fondi*. Each *fondo* is then divided into a number of holdings of the particular type that is best adapted to the terrain. Several *fondi* together make an *azienda* of several thousand hectares, this being the operating unit that is used at present by the local officials of the Authority. There are two kinds of holding, a *podere*, a compact holding, adequate to support a family with the dwelling on the holding, and a *quota*, a small piece of land intended to bring an inadequate peasant holding up to subsistence level. Simple irrigation methods are used here, and the best irrigated land is to be divided among the *quote* so as to ensure a maximum production. This is standard procedure throughout the South. The Sila, however, presents certain special conditions that make a rigorous selection

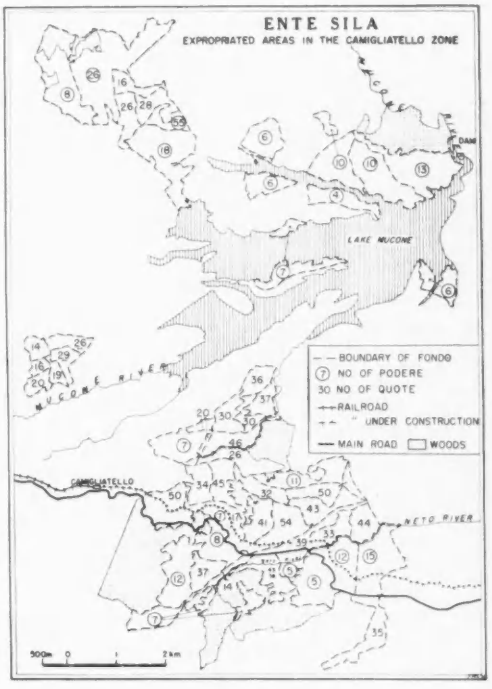


FIG. 9.

of the prospective settlers necessary. To qualify for either type of holding the recipient must have habitually cultivated land on the Sila. To receive a *podere* of 5 to 10 hectares he has to promise to live permanently on his *podere* and not to resume the old habit of shifting to the village in the winter. There are many workers in the surrounding villages who have a little land but not enough to support them, including laborers and artisans, who, however, habitually cultivate a bit of land on the plateau. Such families qualified for assignments of *quote* of two-thirds to one hectare of the best irrigable land, which will produce something like 150,000 lire per year. Families are put on the same *fondo* if they come from the same village, and they are placed in the same locality which they habitually frequented to cultivate or pasture, i.e., they have been settled as far as possible in their habitual work area, so as not to break

FIG. 10. Steep valley-sides in the south of the Sila (Piccola Sila), altitude 1000 meters, newly terraced and planted with conifers.

down group ties and to assist in the later growth of cooperatives. The latter will be a necessity to realize greater production on the groups of *quote* in particular, but it is doubtful just how the peasant will respond here to the co-operative idea. Prescribed rotations include one or two years of clover or alfalfa. Wheat has already completely displaced rye. Good seed potatoes are now being grown as a cash crop. Vegetables and hard fruits offer possibilities. Cattle are to be maintained on each *podere*, and "mixed farming" will be the mainstay of the new economy. An experimental station, established some years ago, has demonstrated conclusively the suitability of the plateau to a wide range of crops and is giving the lead in animal husbandry with a preference for Brown Swiss milk cattle. The plowing of the quotas will require co-operation. The land has been cleared, plowed and sown with public tractors, and it is hoped that these will eventually pass to the peasant cooperatives. The owners of *podere* will do most of their own farm work but all will receive technical assistance from the local officials. The continuance of this on-the-spot guidance is rightly regarded as an indispensable condition for the success of the program. The small cluster of 8 to 10 farms is being adopted rather than the dispersed farm, but all families will be within a few hundred meters of their fields. The problem of settling this high altitude environment is quite unique in Italy.

2. The Hill Zone

Referring again to Figure 7 we now turn to the Hill Zone. This land is developed on severely eroded sands and clays. It should have no more than about a quarter of its surface under

cultivation, since woods, scrub, and grass are a natural protection from the appalling forces of soil erosion to which such land is everywhere subjected. The growth of population in the last 50 years has increased the pathetic competition between workers to rent land or hire their labor. There are 300,000 hectares of poor, hilly, eroded land, and 300,000 people, in this whole area. There are 70,000 families almost exclusively devoted to agriculture living at an overall density of 100 persons per square km. One expert suggests that the population here will have to be reduced by over one-half before a rational economy of peasant ownership can be developed. The peasants have cultivated wheat on steep slopes and erodable surfaces which a rational economy would have left well alone. Santa Severina (SS on Fig. 8) where there were disturbances after the War served as a laboratory of land reform, and much exemplary work in soil conservation, on which the Italians are experts, has been done. But this was one of the most difficult areas on which to start remedial operations. Only 2000 hectares could be expropriated in the commune by the existing law, and these had to be divided into 400 quotas. (Previously 70 per cent of all the families had less than 3 hectares.) This is still inadequate for subsistence, but there is not enough expropriated land to go around. Moreover, it was impossible to consolidate all such holdings, and often the peasant has several plots. This was against the wishes of the planners, but they had no choice. Opportunity is to be given to the peasant to improve his lot, by technical aid, education, and perhaps by the possibility of acquiring more land by purchase, or by employment on the surrounding large holdings. The lands were graded in terms of their productivity (i.e. each terrain unit was given a point value corresponding to its productive capacity) and grouped into new quotas on the basis of the standard *point* value. Land was protected from further erosion and new roads made to the holdings. The new holdings are still small and fall into several strips, but at least the land now belongs to the peasant. Emigration and absorption into non-agricultural occupations offer the only solution for this rural overcrowding. This is the problem throughout the hill lands of Calabria. It is also the problem throughout the highlands of Lucania and Campania, where precisely the same conditions prevail, and where expropriation is no solution, since the expropriable lands are just not there. These are lands of peasant farms and medium-sized properties and operating units.

3. Marquesato Lowland

Now we turn to the third section, the Marquesato in the southeast coastal lowland. Note the rectangle on Figure 8. In this area 60 per cent of the three communes has been expropriated. Here we have resettlement on a clean slate. This rectangle is enlarged in Figure 11 to show the terrain. This is a lowland developed on horizontal strata of soft sandstones on a substratum of impermeable clay. The types of terrain will be evident from the coincidence of the relief with the lithology. This is one of the driest areas in the South, but during the winter rainy season its soils become sticky and unworkable, its earthen tracks impassable, and there are land slips and erosion. Here, as elsewhere, it is a great problem to find plants that will hold together the bare hills of the Pliocene clays. This is a typical latifondista zone. Almost all the land of these communes lay in the hands of a few of the largest land barons in Italy and only a tiny fraction of the total was actually owned or cultivated

by the peasants. The peasants are huddled in two large villages and two outlying settlements where conditions of dreadful poverty prevail. There is a population of 10,000 in Cutro and 7000 in Isola. Here was land monopoly at its worst. The small peasant proprietor was virtually absent. In one of the communes, Cutro, 1500 families—90 per cent of all the cultivators—cultivated 4000 hectares. This was broken up into 9000 pieces that were scattered throughout the commune—2½ hectares apiece—when nearly 10 hectares are needed to support a family on the primitive methods of cultivation practised here. Around were thousands of hectares of good land that for centuries has been in rough pasture. This situation became rapidly worse during the last 20 years, when the population greatly increased and the peasant was driven to grow wheat on whatever bit of land he could temporarily acquire. This is typical of all the coastal latifondista zones.

The next map shows the method of subdivision of this land (Fig. 12). The area of the two communes, Cutro and Isola, is divided into physical units or *fondi* and these are grouped into eight *aziendas*, each of about 2000 hectares and each with a central office with technical experts. The units are shaded according to whether they are being settled by families individually or collectively for the clearance and first plowing of the land. Cutro is an instance of a commune with too many poverty stricken families for its available land and so arrangements are made for some of them to be transferred to adjacent communes. Considerable areas of bad clay lands are being kept by the Authority for afforestation. A spectacular work of land clearance, drainage, plowing and planting is going on here with the aid of a fleet of tractors and paid peasant labor. About 1500 houses are planned, many of which are to be placed on the holdings, while others will be in

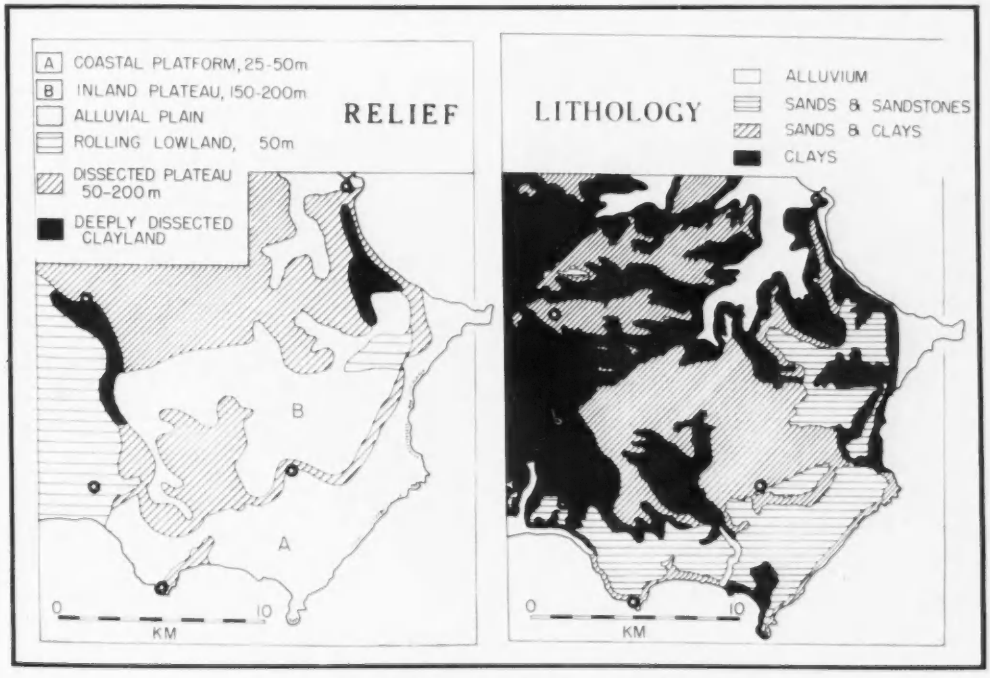


FIG. 11. Relief and lithology of Marquesato Lowland.

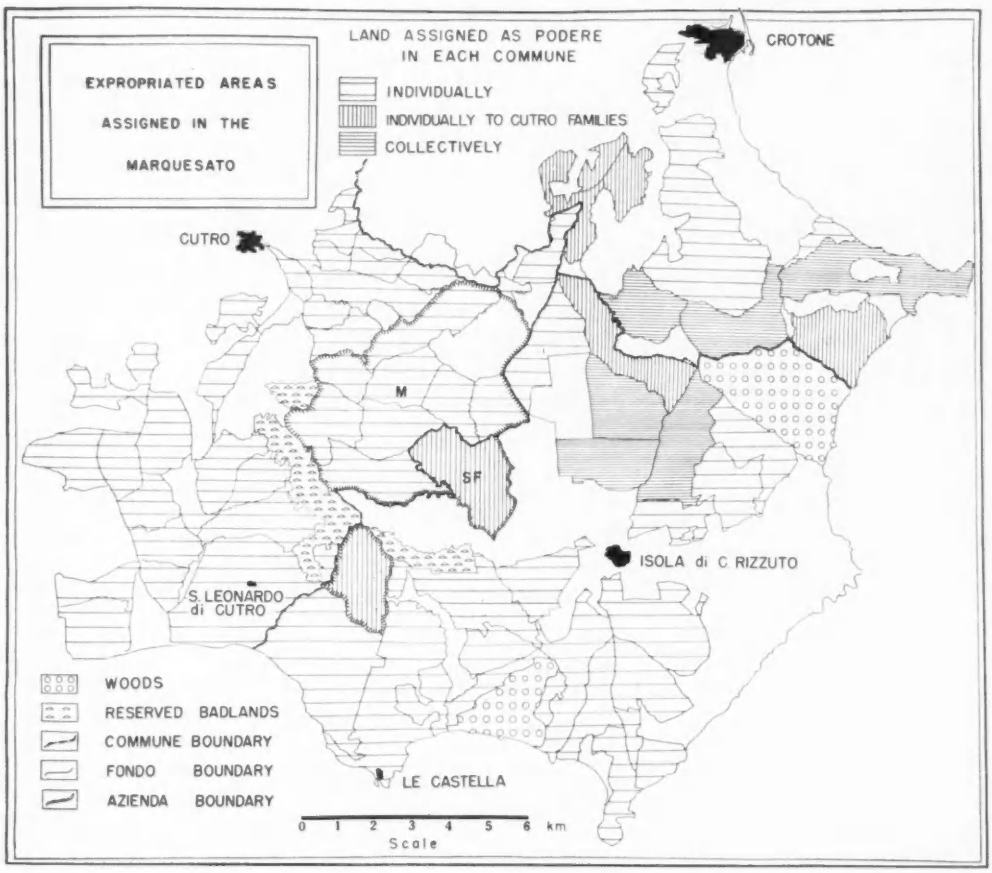


FIG. 12.

groups (discussed later). Over 400 houses were under construction in mid-1952.

4. Sibari and Neto Plains

Finally, the plains of the Sibari and Neto rivers await the completion of irrigation works. Small holdings of two to three hectares will grow citrus, cotton, tobacco, and beets. Settlers will be drawn from the hill villages in the same commune as the land to be irrigated. Some water, it may be noted, is being drawn from artesian sources. In the Corigliano commune over 3000 hectares are expropriated. Some 300 hectares have been handed to the peasants for wheat cultivation, but the remainder will be distributed later. Each will irrigate an area of 1 to 1½ hectares. Only one-third of the irrigable lands of the Neto plain are expropriated. The other two-thirds is in the hands of the private proprietors. Definite assignments of land have not yet been made; provisional assignments have been made until the irrigation plans are completed and the land available for permanent subdivision.

THE AREA OF THE PUGLIA–LUCANIA AUTHORITY

We may now turn to the area of the Puglia–Lucania Authority that was established in February, 1951. The irrigation authority in the same area, however,

was established in 1947, and the special section for land reform is a branch within it. The area is shown on Figure 6 and Figure 13. It operates over one and a half million hectares and is by far the largest reform area in the South. The boundaries of the area are shown in the heavy black line on Figure 13. It extends from the Tavoliere to the Metaponto. Within it there are shown in black the expropriated areas. The main categories of land use are also shown in the *compartimenti* of Puglia and Lucania. The area is clearly defined to the east by the great belt of intensive cultivation of vines, olives, and almonds in Puglia. Holdings in this belt are small in size, underemployment is common, but there are no large underdeveloped properties available for expropriation. The boundary of the land reform area was clearly defined in relation to this land use divide. It runs through the middle of a number of the large communes that lie astride the zone of intensive cultivation around the central great village, and the big estates on the limestone plateau of the Murge (e.g., Andria with 66,000 inhabitants). The boundary of the area is defined to the west in Lucania against the highlands of the Apennines. Western Lucania is a vast zone of small peasant cultivators, with medium-sized properties, but few large properties that might be expropriable. The land here is held in all kinds of obscure and temporary tenures, and the small uninterested property owner, often the local townsman, is as big a problem as the

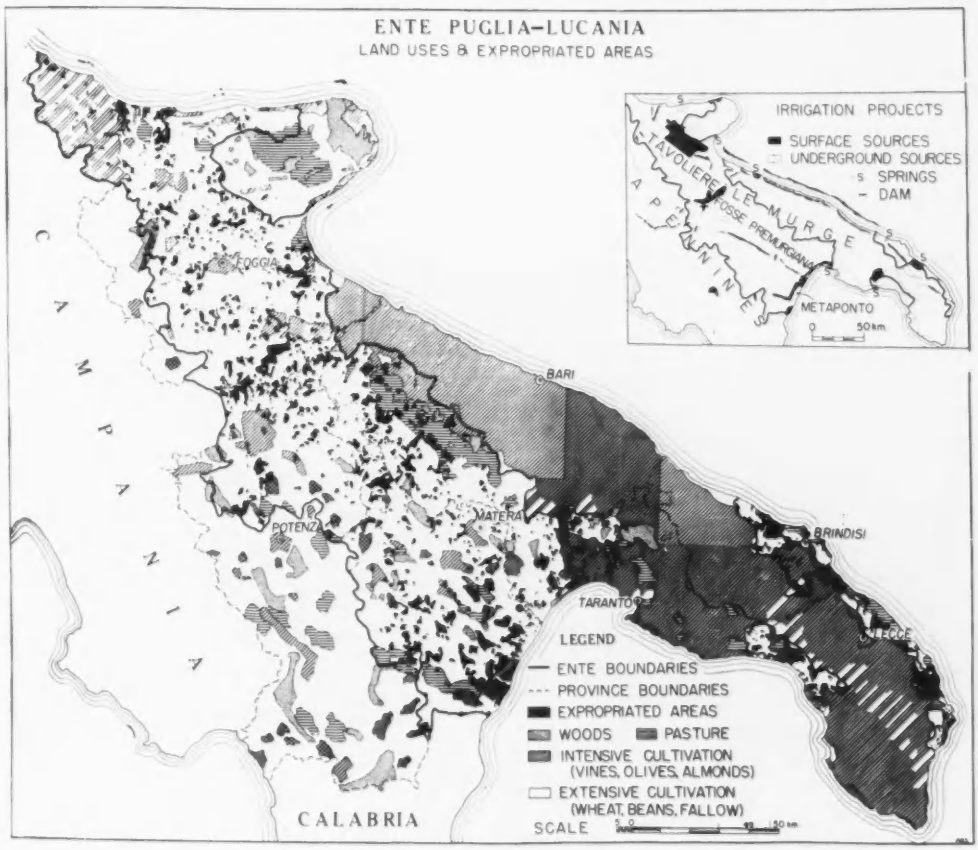


FIG. 13.

large proprietor elsewhere. Cultivation is also very primitive, with a usual rotation of wheat, beans, and fallow. Rotations could be improved, as could conditions of tenure, but the altitude is too high to be suited to the widespread cultivation of the vine or the olive. A large part of the land of each commune is in wood and rough pasture. Rural overcrowding in this zone presents a situation precisely the same as that in the hill zone of Calabria. Land reform is no solution to its problem, and it is not surprising that this area has been one of the main areas of emigration.

Turning now to the Puglia–Lucania land reform area proper, we find that it is a lowland trough with marked physical diversity and a small and precarious rainfall. The main areas are shown on Figure 13. In the north is the Tavoliere, long one of the main areas in Italy for the winter pasturing of transhumant sheep that were taken up to the hills of the Abruzzi and northern Lucania in summer. To the south of it is the valley of the Ofanto, which, with its southward continuation is called the Fossa Premurgiana—the lowland lying at the foot of the big escarpment of the limestone plateau of the Murge. To the south, is the coastal plain known as the Metaponto, that is crossed, and will be irrigated, by the Agri and Bradano rivers. In these areas, it should be noted, are concentrated the chief expropriations. Here, too, are to be found the major areas to be irrigated by the projects now in active construction. Indeed, much of the expropriated areas lie on land that is to be irrigated, and so responsibilities are shared between the reform authority and the associations of local proprietors.

The existing features of this area may be illustrated from a typical commune. Almost all the inhabitants of the commune live in one large congested village with over 10,000 inhabitants, situated on a limestone hill or spur, or a sandstone hill rising above the surrounding clay plains. Around this nucleus is a girdle of minute strips of intensively cultivated land in peasant ownership with tree crops, vines, vegetables, and wheat. Beyond this girdle, as far as the limits of the commune, there stretches an expanse of treeless sown land, in wheat, beans and fallow. (Throughout these lands, as well as in the whole of Lucania, as much as 25 per cent of the sown land in many communes is in fallow). This land is mainly in the hands of absentee proprietors. It is worked mainly in large operating units, called *masserie*, with labor drawn from the villages or permanently installed on the *masserie*. The land is also rented in minute strips to the peasants, who often have to treck up to ten kilometers each day to and from one of their various strips. To each strip they have a verbal agreement of tenure for one to three years after which they must seek another strip elsewhere in the commune. There are also stretches of common land, to which the peasants have right of use (*usi civici*) for pasturing their sheep, collecting firewood, etc. Some of these have been divided by the communes into small quotas over the last hundred years, but these are only up to two hectares in extent at the outside and do not save the peasant from the constant necessity of searching for land or work to supplement his earnings. Such holdings, if they may be so-called, are short lived. Only the peasant, ever on the search for land and work, forced to spend long periods in idleness, is permanent. Here we find both the "non-autonomous" peasant (*contadino*), and the virtually landless casual laborer (*bracciante*).

This state of affairs the land reform program seeks to change. Rapid prog-

ress is being made. By December, 1952, over 30,000 hectares had been assigned to nearly 6000 families. In all, the program will resettle 40,000 families. About 20,000 houses are to be erected, either on farms or in some 50 small clusters. Several such *borghi* are now in construction. La Martella, for instance, is being built in the midst of fragments of expropriated land a few kilometers outside Matera. Some 17,000 people live in this town, in tier upon tier of limestone caves excavated into the limestone slopes of the river gorge. A special act of Parliament provides for the rehousing of these folk. La Martella is the first step in this program. This *borgo* received its 200 families in spring of 1953. Each house is spaced a little apart from its neighbor and has 600 sq. meters attached to it as a kitchen garden and nearby is the compact holding of some 6–7 hectares.

CRITERIA AND PROBLEMS OF PEASANT SETTLEMENT

We may turn finally to the problem of settling the people on the land in general. This hinges on the detailed survey of minute terrain units and of the family budget. The size and economy of the holding are calculated so as to give full employment to the family and so as to yield a *net* income of about 300,000 lire, which is considered, from thorough investigations of numerous family budgets, adequate to support a family of five under present Italian conditions. Examples of the kind of calculation prepared for each type of holding, adapted to particular kinds of terrain in a particular area, are given in Table III. These budgets are for: (1) first class land with vines (table wines) and tobacco; (2) a *podere* on the Sila plateau; (3) a *podere* on the level grain lands of the Marquesato. Numbers 2 and 3 have a deficit that will have to be made up out of other earnings—either on the farm or from a third party outside it. The labor capacity of a family is based on its man-units. According to this, the work day of a woman is equated to 0.6 of a man day and that of a child to 0.5 of a man day. For a family, 240 days is allowed for the first worker (the head of the family), 120 for the second, 80 for the third, and 50 for any others. With a man and wife and three children of working age (over ten) this gives 240 plus 72 plus 40 plus 25, a total of 377 man-work-days. The family budget is based on the following scheme of consumer units: One male adult equals one consumer unit, one woman is 0.6, and three children 0.5 each, giving a total of 3.1 consumer units in such a five-member family. Careful calculations reveal that an average of 100,000 lire is needed to maintain one consumer unit in food, clothing and services, giving a total of about 300,000 lire per family unit of the above composition. (Just how this figure is reached is shown in the first family budget under the heading of "Family Needs," Table III.) All proposed farm types are devised so as to absorb this labor capacity and give returns that will meet its needs, with a margin for saving. A small deficit may be covered by some outside work, or an improvement of farm production.

In laying out the farms the basis is not the size of the particular standard holding which is being used, but the equivalent productive capacity expressed in points. Thus, the land is first surveyed by a team of three (a surveyor, an agrarian economist, and a local resident) and divided into natural physical units in terms of agricultural value. On this basis, the unit is given a point value ranging from 0 to 100. The total point value of an area can thus be calculated and divided by the proposed number of

TABLE III

LAND REFORM IN SOUTHERN ITALY*

(1)—*Type of Podere for First Quality Land in Puglia-Lucania* Adapted to Communes of Gravina, Carovigno, Cerignola	
Land Use	
Sown land with olives	1.00 hectare
Vine (grapes)	1.50 hectares
Total Area	2.50 hectares
Rotation	
Legume—wheat—tobacco or melons—wheat	
Gross Saleable Production	
1.5 hectare vine	324,000 lire
0.5 hectare grain	52,000 lire
.25 hectare beans	16,000 lire
.25 hectare tobacco	66,000 lire
vegetables, etc.	70,000 lire
Total Income	528,000 lire
Family Needs (5 Members)	
Wheat 2.1 quintals per person	73,500 lire
Oil 200 gr. per person per day	32,850 lire
Wine 1 litre per day	18,250 lire
Meat, cheese, salt, etc.	80,000 lire
Various (school, health, ins.)	35,000 lire
Total for Family	300,000 lire
Total Demand	
Vine at 150 days per hectare	225 days
Grain at 34 days per hectare	17 days
Legumes at 25 days per hectare	12 days
Tobacco at 200 days per hectare	50 days
Livestock	70 days
Total Work Days Required	374 days
Labor Available	
1st man—240	240 days
2nd man (woman = 0.6 man unit)—120	72 days
3rd man (boy = 0.5 man unit)—80	40 days
4th man (boy = 0.5 man unit)—50	25 days
Total Work Days Available	377 days
Family Needs	300,000 lire
Farm Costs and Amortization	141,000 lire
Saving	87,000 lire
Total Expenses	528,000 lire
Gross Income	528,000 lire

(2)—*Type of Podere on Sila Plateau*	
Land Use	
Sown land—unirrigated	3 hectares
Sown land—irrigated	2 hectares
Pasture	2 hectares
Total Area	7 hectares
Rotation	
Potatoes—wheat—alfalfa—3 years	
Livestock	
2 cows and 10 sheep	
Labor Available	
Family 5, man-units 2	
Labor Demand	
Potatoes—1 hectare	60 days
Cereals—1 hectare	30 days
Forage—2 hectares	60 days
Livestock	350 days
Total Days	500 days
Gross Income	
Cultivated products	243,000 lire
Livestock products	301,000 lire
Total	544,000 lire
Income Expenses	
Farm expenses	170,000 lire
Amortization, taxes	84,000 lire
Net Income	290,000 lire
Family Needs	300,000 lire
Deficit[a]	10,000 lire

(3)—*Type of Podere on Commune Cutro Isola*	
Land Use	
Sown land	6 hectares
Vine	1 hectare
Total Area	7 hectares
Rotation	
Beans—wheat—sulla—wheat	
Livestock	
1 or 2 cows, 1 or 2 calves, 1 horse	
Labor Available	
Family 5, man-units 2	
Labor Demand	
Grain—6 hectares	192 days
Vine—1 hectare	125 days
Livestock	60 days
Various	20 days
Total Days	397 days
Gross Income	
Beans	56,000 lire
Wheat	234,000 lire
Livestock	78,000 lire
Vine	120,000 lire
Total	514,000 lire
Income Expenses	
Farm expenses	148,000 lire
Amortization, taxes	70,000 lire
Net Income	296,000 lire
Family Needs	300,000 lire
Deficit[b]	4,000 lire

*From data supplied by the Sezione Riforma Fondiaria in Puglia, Lucania E Molise (offices, Bari), and by the Ente Sila (offices, Cosenza).

[a] Each peasant will require work from an outside party, at 500 lire per day, for 20 days.

[b] Each peasant will require work from an outside party, at 500 lire per day, for 8 days.

holdings, so as to give an average point value. Each holding as demarcated on the ground is based on an aggregate of this number of points. All holders thus get equality of treatment. The essential aim of the program is to increase production three or fourfold per unit of area. This is being done by the introduction of forage grasses into the rotations for livestock feeding; by the cultivation of vines and olives everywhere they are suited; and by growing such crops as cotton, tobacco, and citrus on irrigated lands. The size of the type holdings ranges from about one and a half hectares, as in the irrigated lands of the Sibari plain and the Metaponto, to about seven to ten hectares on the poor lands on the Murge or on the high Sila plateau.

A final problem concerns the development of cooperatives. The basic plan in this reform is the small family farm unit with a minimum size consistent with an adequate living standard and labor absorption. Arguments can well be raised to the effect that production would be more "economic" or "efficient" with larger operating units employing machinery and peasant labor. Without going here into the pros and cons of this argument, suffice it to say that even the small holdings planned often involve too much work for the peasant working with his mattock or plow, and the holding, especially on quotas, is too small to permit any kind of investment in animals for farm labor. It is intended to overcome this difficulty by the development of cooperatives, not only for buying and selling, but for the common working of the land with tractors. The most time consuming job is plowing and this the tractor can do on the sown land, while tree and bush crops will be left to the peasant. It is with this in view that the groups of holdings are sometimes being laid out with the land uses designed in strips so that the tractor can plow in one piece the strips belonging to each holding. This applies particularly to quotas, but it seems that it will be necessary also on autonomous holdings as in the Marquesato. In such cases, the farmsteads are spaced at intervals along the roads.

Lastly, the subdivision of the common lands in the past has revealed that such minute holdings, when allocated to the peasants without any kind of guidance or assistance, have almost always failed, and certainly have not supported the peasant family. This has often been the case in the formation of peasant holdings in other central European countries. The Italians are set on keeping qualified technicians on the spot, not merely during the duration of the program, but as a permanent institution for the advice and guidance of the new cultivators. Further, credit facilities must be available to permit the peasant to go ahead who has the initiative. For, be it noted, all the peasants start off from scratch, since they are selected by need, not ability.

CONCLUSIONS

It may now be asked, what contribution is this program going to make to the alleviation of the *Mezzogiorno's* problem of poverty—which means excess numbers and lack of work, and so low income per capita, under the existing conditions of living. As the law stands the land reform program will settle in the country as a whole about 500,000 people. Some 300,000 of these will be in the southern mainland. This, however, is not all. For the expropriated areas are scattered, and the work expended on them among the new settlers will undoubtedly have repercussions on those around. Indeed, the proprietors in these areas are legally obliged to undertake improvements. And these areas are often to be irrigated.

There is also a great absorption of labor in public works, the figure reaching nearly 26 million work-days in April of 1953 for all works undertaken by the *Cassa*. It is difficult, in other words, to isolate the total effects of one part of a program of total resource development. Specifically, in the southern mainland alone, the new settlement will directly involve both the families and those brought in to service them, and may therefore total about 500,000. The conditions of living in the hill lands of Lucania and Calabria, that cover by far the greatest area in the South, will not be appreciably affected. Only emigration, industrial development, and continued public works, will help relieve the problem in these areas. However, the fact that this spectacular and impressive program of land reform is, in financial terms, little more than one-quarter of the total ten-year program, is an indicator of the magnitude of the task on which the Italian government has embarked. Man-land relationships are being profoundly changed and new patterns of settlement established that are totally different from the traditional ways of living in southern Italy.

BOOK REVIEWS

Resource Conservation: Economics and Policies, by S. V. Ciriacy-Wantrup. xii and 395 pp.; index. University of California Press, Berkeley and Los Angeles, 1952. $6.50. 9¼ x 6 inches.

The literature on conservation of natural resources is becoming increasingly abundant and not uncommonly is concerned with a particular resource or problem. Much of the writing on conservation over the past half century has something of the quality or character of special pleading for a cause. Witness the movement to save the forests by Gifford Pinchot and Theodore Roosevelt, the drive to save the soil by Hugh H. Bennett and his contemporary enthusiasts, and the more recent misgivings about the adequacy of the supply of water to meet the needs of the nation. This does not mean that there has not been during the first half of the twentieth century concern about all categories of resources and public policies in respect to the development, use, and possible depletion of resources.

Resource utilization in the United States was originally a private matter and to a large extent remains in the hands of the people involved in making capitalism function to achieve important economic and social objectives. But the government has become involved in various ways in the utilization and conservation of natural resources particularly through the construction of great, multiple-purpose projects, the regulation of grazing on public lands, the reclamation of irrigable lands, and by other means. Private enterprise and public action operate jointly, sometimes cooperatively and sometimes in competition, to produce a mixed economy of gigantic proportions both making heavy demands upon the resource base to supply the enormous market in America and abroad.

Professor Ciriacy-Wantrup has recognized the need for an examination of the conservation movement, its methods or technologies and policies in terms of a body of economic theory which has application in connection with conservation. The author has approached the subject of conservation from the point of view of the economist and has examined the difficult and multifarious problems of resource utilization largely in terms of economic concepts. He displays a sound and comprehensive knowledge of the basic facts about resources with a slight imbalance in favor of those resources and conditions more appropriate to the area west of the 100th meridian.

Part I, consisting of four chapters, is general in character and is intended to orient the reader in respect to the subject. Most of the ideas presented are familiar to the student of economic geography.

Part II and Part III, embracing together 11 chapters, make up a major section of the book. Here the author discusses at length, under the conditions chiefly of private enterprise, the significance for conservation of such factors or forces as the interest rate, prices, price supports, property rights, tenancy, credit, taxation, market form, and economic instability. For example he calls attention to the probability that price supports, because of their uncertainty, tend to induce exploitation in the present and may result in depletion. Attention may be drawn to his observation that a tenant with a short-term lease may have little interest in conservation unless the contract is carefully drawn to prevent wasteful exploitation.

Sections IV and V, consisting of Chapters 16 to 21 inclusive, are devoted to a discussion of public policy in the field of conservation. The author presents an array of topics and themes familiar to all who have read the numerous reports on regional and national planning during the past 20 years. Public policy in respect to the conservation of natural resources is expressed in the acts of legislative bodies and the regulations of agencies and bureaus of the government. Fundamental principles of economics are reviewed to test the soundness of proposals of the governmental agencies charged with administration of social policy. In this section the author lists and discusses the various regulations that have become a part of the social and economic system in which the people carry on their life and work. Some of these regulations apply to the agricultural use of land through acreage control, forest use, grazing, wild life, oil and gas, mining, and others.

Conservation takes on international aspects in the case of fugitive resources such as fish, other types of marine life, migratory birds, oil, gas, and ground water, but by bilateral and multilateral agreements minimum standards of conservation may be established. The author selects for review numerous conventions including the international commodity agreements which are intended chiefly to reduce the unfortunate consequences of price instability. The

volume is concluded with a plea for a coordination of programs and policies in respect to conservation.

Here is a book that is concerned with ideas and deserves careful study by all concerned with the conservation of resources.

GUY-HAROLD SMITH

The Ohio State University

Canadian Regions: A Geography of Canada. Edited by DONALD F. PUTNAM. ix and 601 pp.; maps, ills., diagrs., tables, index. Thomas Y. Crowell Co., New York, 1952. $11.00. 9½ x 7 inches.

It is with great expectations that one opens this new book on Canada, the purpose of which "is to provide a balanced and up-to-date treatment of the available geographic information." One puts it back on the shelf with a feeling of admiration but, at the same time, of thoughtfulness.

The huge task of organizing the contributions of four authors with different backgrounds into a single volume has been accomplished with considerable success. However, the attempted scheme has been followed almost too rigidly; i.e., the individual author did not have a chance to treat the sections he dealt with according to his *inherent geographic style.* The steady repetition of titles introduced in the first chapters has a tiring effect on the reader. Admittedly, a persistently parallel approach to the eight regions given separate treatment in the book was perhaps the only means to *balance* the volume. Yet the question has to be asked whether *Canadian Regions* would not have gained personality by leaving more freedom to the individual writers. This is particularly evident if the book is compared with G. Taylor's or R. Blanchard's writings on Canada.

Chapters 1, 23, 24, and 25 deal with Canada as a whole. "Physical Background," "Canadian Production," "The Patterns of Commercial Activity," and "Problems and Trends in National Development" are discussed by Donald F. Putnam, who is also responsible for the regional chapters on Newfoundland and Labrador, the Maritime Provinces, Southern Ontario, Northern Ontario, and the Prairie Provinces. The Province of Quebec is dealt with by Benoit Brouillette and British Columbia by Donald P. Kerr, whereas J. Lewis Robinson has contributed the chapter on the "Canadian Northland." Each of these eight major regions is discussed in terms of physical geography, human geography, historical background, economic geography, and, with the exception of Newfoundland and Labrador and the Northland, "Regions and Cities." The reader will find a wealth of information on modern Canada presented in easily readable text and in highly instructive and well chosen maps and diagrams.

With the help of a very detailed index the book even attains the value of a geographic encyclopedia on Canada. This surely was not the aim of writers who used "Canadian Regions" as the book's title, suggesting that some sort of regional integration was attempted. "Within each of these regions," it is stated (p. 41), "we shall try to integrate location and area, land forms, climate, vegetation, soils, population, settlement patterns and economic activities." It is the impression of the reviewer that in this respect the goal was not reached. Too many details obscure rather than reveal the *face* of a particular region.

The same criticism can be applied to the multitude of "regions" established in the introductory chapter as well as in the regional parts. Speaking of the eight aforementioned Canadian Regions it is admitted that "they are regions of convenience and their boundaries are arbitrary. Yet they are realities, known, understood and accepted by most Canadians without question." For non-Canadians they are harder to accept. Since so much effort has been spent in delimiting regions on a larger scale (see, e.g., Figs. 41, 56, 57, 68, 73, and so on, 42 in total!) a synthesis on a countrywide scale should have been possible. Giving due allowance to the easier presentation of statistical data when applied to administrative regions it is still disappointing that political boundaries were used in delimiting the major regions. Or should one not be surprised to find the Alberta Rocky Mountains included in the chapter on the Prairie Provinces, or Ottawa under "Southern Ontario," whereas Hull, contiguous with the former but lying on the other side of a political boundary, is described under "The Province of Quebec"? Another consequence of overregionalization is a passage like the following: "The Western Sandy Upland lies between [these] two clay filled basins and has rather rough topography and sandy soils" (p. 298)—a rather scanty description of the physiography of some 1000 square miles considered important enough to form a physiographic region of Northern Ontario.

A few other statements are questionable, such as these: "Probably the most significant geographical facts concerning any area are the numbers, density and distribution of its human inhabitants" (p. 86), or "The Quebec region is unique, its geographic qualities cannot be matched anywhere else"! (p. 194.) A few minor mishaps should be removed in a second printing: Mean Annual Temperature is given as 37″ in Figure 19; the key to Figure 198 is missing; "Purcupine Gold Field," is the caption for Figure 204; some maps (e.g., Figure 207, Figure 4, and Figure 84, the latter two particularly if compared with the excellent representation of relief in Fig. 281) should be brought up to the high standard of the other cartographic work.

There can be no doubt that *Canadian Regions* is a textbook of high quality. From the point of view of the student it is perhaps one of the best regional texts ever written. It is also an inspiring document of a country to whose development and prosperity geographers are contributing a great deal. The authors are to be congratulated for it. If they have split the Gordian Knot of the Region with a sword they are in good company. Who will untangle it?

DIETER BRUNNSCHWEILER

Clark University

Japan's Natural Resources, by EDWARD A. ACKERMAN. xxv and 655 pp.; maps, diagrs., ills., index, appendixes, chapter notes, end page maps in color. University of Chicago Press, 1953. $25.00. 10 x 7¼ inches.

The title of this work scarcely does justice to its varied content. It is much more than an inventory of Japan's natural resources for it likewise discusses some, although not all, of the country's economies and in so doing it elaborates on the topic of resource use and misuse. It also makes recommendations for their more efficient utilization in the future. In the author's own words, "This study is thought to be the first undertaken for a detailed analysis of the total resource position of any nation and the possibilities of integrated resource management for that nation." Thus, avowedly it is meant to contribute to the field of national planning.

Mr. Ackerman has organized his work into two main sections. The first includes a description of the elements of Japan's physical environment, its food supply and food needs, fisheries, forestry, and minerals, together with an appraisal of their present level of development and use. Section two is in the nature of an evaluation of the potential productive capacity of Japan, and the possibilities for technical improvement in resource utilization under the stimulation from an already great, and rapidly growing, population pressure upon the land. A third, and much shorter, division has the somewhat ambiguous title, "Japan and the Western World." In reality it contains a summary of the basic resource deficiencies of the Island Empire within the forseeable future and the consequences of the Japanese resource-management policy upon the country's relationships with the underdeveloped areas, more particularly those of eastern and southern Asia, and indirectly with the economically advanced non-communist world as well. In addition to the three sections mentioned there are eleven appendixes, three of them bibliographies. A fourth is a list of the chemical elements and their symbols, the reason for the inclusion of which is not clear.

This work is a limited revision and modest expansion of an earlier volume, "A Report on Japanese Natural Resources Prepared in General Headquarters in 1948," published in Tokyo in 1950. Mr. Ackerman, in his introduction, informs the reader that he prepared the original manuscript of the above Report while he was a member of the Natural Resources Section of S.C.A.P. in Tokyo, but subsequent to its submission to the Chief of that Section it benefited from criticisms and revisions made by numerous specialists in the Natural Resources Section. In the form it was published in 1950 by G. H. Q. the original author's name and all text credits to him were deleted as were also the Foreword and the Conclusions. So much of the text of the present volume so closely resembles that of its 1950 predecessor that one will hesitate to pay the exorbitant price of $25 for the 1953 University of Chicago publication if one is fortunate enough to possess a copy of the earlier Tokyo edition. Two of the most readily observable differences between the 1950 and the 1953 volumes are that in the latter many of the statistics have been brought down to about 1950 and two entirely new chapters have been added, one entitled, "Inland Water-Control and Water-Resource Development" and the other, "Japanese Resource-Management Policy and the Problem of Underdeveloped Areas." But throughout the book there are additional less conspicuous revisions of fact and conclusion resulting from the author's access to newer references or to later statistics. Both the earlier and later editions are profusely illustrated with excellent half-tones, maps, and diagrams, while the number of well-chosen tables approaches 150. If it is the number of half-tones which has obliged the publisher to set such an exorbitant price for the 1953 edition, one would willingly dispense with many of them in order to obtain a less luxurious volume. Unfortunately, the 1953 edition does not contain the nine very useful folded maps which accompanied the Tokyo edition.

By comparison with its merits the book's faults are few and are chiefly to be found in matters of organization and in the relative weight given to various topics. For example, the reviewer feels the lack of a unified treatment of Japan's population geography. The resource idea is functional; it always implies human needs. Natural resources are the physical earth in the service of man and hence man, or population, is as much a part of the resource concept as is the natural environment. Any appraisal of Japan's resources must, therefore, be in terms of the requirements of a group of people of a particular size, with particular growth potentialities and with particular social and economic characteristics and it is these facts concerning population which need elaboration

To be sure there are significant references to population scattered throughout the work, but these do not wholly fill the need for a specialized treatment of population such as national resource development might require.

It may also be pointed out that the treatments of the several elements of the physical equipment are scarcely in proportion to their relative importance. Thus the topics of climate, relief or terrain, soils, drainage, and water supply are all covered in 29 pages with two-thirds of this space occupied by illustrations and tables. The result is a somewhat inadequate treatment of these highly important features of the physical earth. By contrast, minerals, including hydroelectric power, occupy 106 pages. It could be wished, likewise, that the author had not seen fit to present the climatic subdivisions of Japan in the form of a wholly local classification and quite unrelated to any standard world scheme of climatic classification. The result is that comparison with other parts of the world is impossible.

Mr. Ackerman deserves high praise for having produced a scholarly treatise, unique in its point of view and timely in its appearance, on one of the world's strategic areas. The work has its roots in the author's experiences while serving for two extended periods on the staff of the Natural Resources Section of S.C.A.P. in Tokyo. The abundant resources of S.C.A.P. were thus at his disposal thereby creating a most favorable environment in which to gather and test the materials which were eventually gathered into this report. Opportunities were provided for extensive travel and firsthand observation in the field; abundant assistance was available to aid in collecting and processing statistical, photographic, and graphical materials; while even more important were the benefits derived from the contributions and criticisms provided by the staff of technical experts accumulated by S.C.A.P. in Tokyo. It seems unlikely that serious errors of fact or judgment would become lodged in a work which was fortunate enough to have the critical scrutiny of so many specialists during its formative period. Nevertheless, it would be interesting to learn what Japanese critics might have to say concerning this wholly American viewpoint of resource use and misuse in Japan.

It is principally in the last chapter where Mr. Ackerman ranges widely over the field of national resource management policy, not only as it applies to Japan, but also to the world's underdeveloped areas in general, that there will be more honest debate concerning the validity of the judgments expressed and the conclusions drawn. This is no reflection on the competence of the author, but, rather, is to be expected because of the inherent nature of the materials being handled. It is a field in which genuine experts are lacking and honest men disagree. Mr. Ackerman looks upon Japan as "an advanced center for pilot experiment" in integrated resource management which could be used to demonstrate to other areas of dense population in the Far East the possibilities of the method. He points out as the glaring omission in the present development policy of Japan the lack of any resource development projects which are directed toward the general public welfare without regard to profits.

Altogether this is a work on a frontier field, which is soundly conceived, logical in its arguments and conclusions, and with the latter abundantly supported by facts.

GLENN T. TREWARTHA

University of Wisconsin

Farming in Finland, by W. R. MEAD. xv and 248 pp.; maps, diagrs., ills., tables, appendixes, index. Univ. of London, The Athlone Press, 1953. 30 s. 8½ x 5½ inches.

The author has chosen to place on record for the convenience of the English speaking world a detailed, carefully considered, and well written presentation covering Finland's agricultural struggle. We say "struggle" because as this book reveals clearly and unmistakably the job of making the land of this far northern, hard-working nation yield adequate and dependable crops is no mean achievement. But to put the objective in the words of Mead, the investigation's ". . . concern is the face of the land and the changing use to which the land is put. . . . to examine those farm features (including the seasonal rhythm of rural life) which are a response to environmental conditions and to consider, side by side, with these features, the modelling of the landscape by the Finnish Farmer."

An historical sketch and statement of the regional and physical setting serve as a background (1) for the subsequent discussion of land clearing, drainage, grassland, and crop "husbandry" and (2) for the problem of resettlement in relation to resident and displaced persons resulting from Soviet occupance of parts of eastern Finland after the Finnish-Soviet War of 1939–40, and additional cession of territory after World War II.

Although Mead is not a "determinist," to use a world viewed in a derogatory sense by some geographers, no one can read his authoritative observations without being deeply impressed with the critical role which the natural environment of man in Finland has played in the course of his past and present experiences. The Finns have had little choice in the kind of economic life they might follow and have had to bring to play tremendous courage and infinite patience in the face of great odds to attain the success which has been theirs.

If any criticism of this excellent book may be expressed, it would focus upon two items only. Some of the chapters are introduced with quotations reproduced in the Finnish language without a translation for the benefit of those readers of English who are unfamiliar with Finnish. The other comment is one which the writer has made in other reviews and which applies not only here but to British circles generally. Indications of latitude and longitude have been omitted. Their absence from a drawing purporting to be a map relegates the drawing to a category other than that of a map.

The book is concluded with several appendixes, helpful to the reader in his understanding of various parts of the discussion. The author has amply documented his interpretations with observations of his own, made in the course of several visits to Finland, with citations from persons who were helpful in Finland, and with references to the literature both published and still in manuscript form.

Farming in Finland represents a job effectively done and reveals a record which should be of interest not only to the geographer but to the agriculturalist as well.

EUGENE VAN CLEEF

Ohio State University

The Iron and Steel Industries of the South, by H. H. CHAPMAN, with the collaboration of W. M. Adamson, H. D. Bonham, H. D. Pallister, and E. C. Wright. 427 pp.; maps, charts, bibliogr., index. University of Alabama Press, University, Alabama, 1953. $6.00 paper, $7.50 cloth. 10½ by 7½ inches.

Dr. Chapman and his associates have written one of the finest monographs available on the steel industry. Their study fills a major gap in the literature on the industrial geography of the South. As the authors have stated in the introduction the orientation of the study is toward the future rather than the past, but their appraisal of the problems of future industrialization of the region has been based on a careful analysis of past and present. What is perhaps just as important is the fact that the southern steel industry has been treated not as a detached, isolated entity, but rather as an integral part of the nation's over-all industrial structure, sensitive and responsive to its technological and operational developments. Because of the limited space of this review only the high lights and general conclusions of the work can be presented here.

Aside from a general introduction (Part I), the study is divided into four major sections. Part II is a very detailed analysis of the resource base of the southern steel industry. The analysis indicates that while coal and iron ore resources within the area are adequate in amount for even an expanded development, they are limited by the fact that a single company controls the better ore supplies, while others have definite ore reserve problems. In addition, and perhaps more acutely, there are numerous problems of quality of coal and iron ore deposits and difficult mining conditions which limit their use.

Part III is an analysis of the basic iron and steel industries of the Southeast. Topics such as historical development, production trends, companies, mining and operational problems, and raw material assembly costs are thoroughly treated. Unfortunately, for the geographer at least, the discussion of plant facilities is largely on a company basis; an analysis based on producing districts would have been a useful addition. For the reviewer, the detailed discussion of raw material assembly costs was of major interest. Contrary to previous analyses, these data show that although the district still possesses a limited advantage over competing northern centers because of the proximity of raw materials, the locational advantage of the Birmingham area in transportation cost of assembling raw materials has been largely nullified by high mining and beneficiation costs. The steel market and trends in consumption of steel are discussed in the fourth section of the report. The materials presented indicate that, although the southern market has grown as fast as or in some cases faster than the national rate, its relative position is still low. Some of the factors which seem to be encouraging more rapid growth are increasing urbanization, mechanization of agriculture, rising income levels, and greater diversification of manufacturing.

The authors feel that the effects of pricing policies adopted by the industry have retarded past expansion of the southern steel industry both in terms of basic capacity and of metal fabrication. However, they emphasize the fact that other factors such as the predominance of agriculture, low degree of urbanization, and late response to industrialization have contributed their role as well. Another factor stressed is the ownership of southern mills by large corporations, which, though they have provided strength and stability to southern operations, have tended to maintain the status quo and have been more highly interested in the northern highly developed areas. The authors conclude that continued growth is possible in the future but by no means inevitable or without difficulty. It can be materially advanced if there is enlightened action by companies, public officials, and promotional agencies.

The report is accompanied by 22 maps (16 of which were contributed by the T.V.A.) and many excellent charts and diagrams. Most of the maps are full-page in size, and some are in color; however, the utility of the plant facility maps is limited by their small scale and excessive detail. Another minor criticism that can be made is

related to the areal coverage of the study. Although the study is entitled "The Iron and Steel Industries of the South," almost exclusive attention has been paid to the nine southeastern states. The inclusion of Texas and Oklahoma seems to have been almost an afterthought as a limited response to recent developments there. The treatment of these areas is superficial; they deserve greater attention in another more detailed study.

The only important criticism that might be leveled at this study from a geographic viewpoint (and it was obviously not designed for any one audience) lies in the treatment of the South as a unit. Little attention is paid, except in the resources section, to the marked intra-regional differences. However, such analyses might have broadened the scope of the study beyond economic feasibility. This detailed, objective report makes available a wealth of materials not readily accessible elsewhere and should be extremely useful for both the scholar and the industrial planner.

ALLAN L. RODGERS

The Pennsylvania State College

Economics of Natural Gas in Texas, by JOHN R. STOCKTON, RICHARD C. HENSHAW, JR., and RICHARD W. GRAVES. xvi and 316 pp.; maps, diagrs., index. Bureau of Business Research, College of Business Administration, University of Texas, Austin, 1952. $5.00. 9½ x 6¼ inches.

In contrast to the countless economic studies of the various aspects of petroleum and its role in the modern industrial society the literature on natural gas is pitifully small. This partly reflects the fact that natural gas problems have been national rather than international in scope, but more especially it is probably due to the recency of the surge to eminence of gas in the competition among fuels. Yet in 1952 natural gas contributed 24 per cent of the total heat units consumed in the United States notwithstanding the fact that its very physical nature eliminates it entirely from the transportation fuel category. One of the first and certainly most authoritative surveys of the natural gas industry yet to appear is this publication of the Bureau of Business Research of the University of Texas, an organization which has long been concerned with the utilization of the resources of the State. Despite the title it is essentially a descriptive survey of the United States natural gas industry although quite reasonably Texas, which accounts for almost exactly one-half of the total national production, is frequently given special emphasis.

There are few available facts about the natural gas industry that have not been assembled here although there is little that is new. Much material has been drawn from the two bulky volumes of testimony and reports published by the Federal Power Commission in 1948 (*Natural Gas Investigation, Docket G-580*, Smith-Wimberly and Olds-Draper reports). Where Bureau of Mines, American Gas Association, or Texas Railroad Commission statistics are employed, 1950 is the terminal date. The 38 charts and graphs and 86 tables which are scattered throughout the body of the report suggest the amount of detail as well as the emphasis on statistics; in addition there are several small-scale maps both of Texas and of the entire country. There are chapters on utilization of both natural gas and natural gas liquids (L-P gas), on production, reserves, pipelines, taxation, public control, conservation, and the competition among fuels. Only three chapters, those on natural gas taxation, public control, and conservation (proration) are specifically concerned with Texas conditions.

To an unusual degree the economic problems of the natural gas industry are inseparable from the technical ones. One of the merits of this well-documented volume is its descriptions of technology and the demonstration of its relationship to the economic problems of the industry. Although the authors frequently remind their readers that gas is an exhaustible resource their emphasis is centered on what petroleum and chemical engineering advances promise in the near future, not on the more dubious distant horizon. The extraordinary demand for this preferred fuel, even in areas far removed from the gas fields, is not unrelated to its cheapness relative to the prices of coal and fuel oil. Governmental controls on prices within the natural gas industry, both real and threatened, have contributed to this situation. Rather belatedly it is beginning to be realized that energy is a common denominator, that the price of one fuel cannot well be controlled unless the prices of all fuels are controlled. The reviewer would emphasize that the "public utility" status of the gas industry, to the extent that it has stimulated natural gas consumption at the expense of other uncontrolled fuels, appears to be needlessly hastening the eventual day of scarcities.

JAMES J. PARSONS

University of California

The Way of the World, by GEORGE H. T. KIMBLE. x and 123 pp. George Grady Press, New York, 1953. $2.50. 9 x 6 inches.

In 1952 Dr. Kimble, till lately Director of the American Geographical Society and now head of the Twentieth Century Fund African Study, gave three lectures, the so-called Rushton Lectures, in Birmingham, Alabama, and these lectures have now been published. They certainly deserve a wide audience and any person, geographer or not, will have a most pleasant evening reading the small book. In fact it is difficult to put it aside before it is finished. Perhaps this book could do for geography what

Rachel Carson's book, "The Sea Around Us," did for oceanography, namely to spur public interest in the field of modern geography.

Dr. Kimble writes very well. He has a remarkable knowledge of the past as well as of the present and he has that most important attribute for any geographer—a deep love for the world and its people and a desire to be of service.

The three lectures follow each other logically. In the first one—The Strength of the Earth—he discusses the world and its resources with special emphasis on the rather neglected tropical and polar regions as reservoirs of future development. The second lecture—The Perseverance of Man—tells what man has done with his environment from the earliest days up to the present and beyond that with an outlook into the future. The third lecture—The Resilience of Society—contains an evaluation of the role of society in the world and the necessity of cooperation and understanding between nations without the dominance of Great Powers.

For the economic geographer one of the chief values of the book lies in the discussion of the world's food supply. Kimble's position is about half way between the advocators of despair and those who see the future in a rosy light. The author realizes the destruction which man has brought to the earth's surface and he gives some striking examples, but he also brings out clearly how man has increased the productivity of the soil and will make greater use of some of the world's yet almost untouched resources, such as those of the ocean. Sometimes his enthusiasm runs away with him and his description of meals consisting of plankton and fungi do not sound too appetizing even if he thinks that advertising agencies which handle bottled drinks and chewing gum could be relied upon to put the idea over. Also his final statement on his belief in the kingdom of God as a precondition of survival has no relation to the rest of the book.

Here are a few minor criticisms. Pompeii was not entombed in lava but was covered with ash and stones; nor is it clear how manure can be enriched by imported feed grains. The author is also rather severe in his judgment of white man in the tropics. While there are cases of deterioration, the majority has not lost its character or moral sense. The present difficulty is that white man in the tropics is bewildered in a period of native awakening and desire for power.

However, all this is minor. The value of the book is its strong plea for understanding the task man faces in an overcrowded world, the call for more production and a better life. This has been well done and the reader at the end lays down the book with a better appreciation of the problems while wondering what the future will bring.

S. VAN VALKENBURG

Clark University

Sowjet-Fernost, Eine landes- und wirtschaftskundliche Übersicht, by Erich Thiel, Osteuropa Institutes, München. 332 pp., maps, bibliogr., index. Isar Verlag, München. D. M. 19.80. 9 x 6 inches.

In the first thorough and systematically presented regional geographical study of the Soviet Far East to come to the attention of this reader, Erich Thiel has done a great service to advanced students interested in getting a better perspective as well as increased knowledge of this little known region of the earth. The balanced treatment of all aspects of the geography, physical, cultural, historical, and economic, provides a first-class illustration of the ecological method of portraying a geographical region in the large sense. The wealth of information is prevented from becoming "almanaical" by the author's able analysis of cause and effect that gives meaning to the facts observed.

Organizationally, the book is divided into two major sections, one entitled "general" and the other "special." Under the former, four chapters with numerous subheadings discuss "The natural relationships," "The population," "The economy," and "Trade and transport." The "Special section" amounts to a discussion of some detailed aspects of the 18 sub-regions, including such sub-regions as "the Amur Plain," the Okotsk Coastland, the Kuriles, and the island of Sakhalin. While distinguishing the "Far East Proper" from the region between Lake Baikal and the Amur drainage, the strip eastward of Baikal, between the Trans-Siberian Railroad and the new Baikal-Amur Magistrale (BAM) 300 miles northward, also is included in the author's "Soviet Far East." This is justified because its transport and economic ties are much stronger with the east than with the west and because of its close orientation historically and in most other respects to the Far East in its broadest sense.

The importance of the Soviet Far East to the Soviet Union is emphasized as an outlet to the Pacific, and the author supports the old thesis of the "urge to the open sea" of landbound Russia. Moreover, it is because of its situation in, and the development of, this eastern region that the Soviet Union has become a major Far Eastern Power. The development of air transport has made more intimate Soviet contact with the Chinese southlands by reducing rapid travel from the 2250 km. distance via rail through Manchuria to 1600 km. by air. The author also points out that there is only an 800 mile gap between the railhead at Ulan Bator in Outer Mongolia and the Peking–Pao-t'ou Railroad at Kalgan, with little topographical obstacle to quick construction for greatly shortened rail connection between Trans-Baikalia and Peking.

In discussing the physical relationships, the author brings out many interesting facts. The relief in Trans-Baikalia, for instance, is not so marked as a glance at the map might lead one to believe. Although the ridges rise to 1000–1400 meters elevation, the valley plains also are high, between 600–900 meters. Moreover, the slopes rise only gradually to the ridges. The landscape of Trans-Baikalia differs from that of the Far East Proper where the bald crests rising above the forest line are prominent in contrast to their rather scattered occurrence in Trans-Baikalia. Moreover, because of the moist monsoonal climatic influences that affect the Far East Proper in contrast to the Arctic oriented dry climate of Trans-Baikalia, there is a tremendous difference in other aspects of the landscape.

In recent times strategic interest in the Arctic regions has increased concern both in North America and the Soviet Union with the permafrost problems of the far north. The far-reaching effects of permafrost are discussed by the author both as it pertains to natural drainage and earth phenomena and as it affects man's economic activities. One aspect of the drainage in this region is the lack of deep water penetration after precipitation. The effect of heavy rainfall is reflected in the immediate and rapid rise in stream volume and the sudden drop in volume after rainfall has ceased. Agriculturally, permafrost in the regions of low rainfall has some beneficial effect in acting as a reservoir of moisture which is released gradually as the summer sun warms the surface. Serious and at times spectacular effects of permafrost conditions occur in connection with road, railroad, or building construction. In the case of shaft-mining, even diamond boring machines can present disconcerting problems, because, if the motor stops for only a few moments, the borer freezes fast in the water of the bore hole.

The analyses of population changes and production statistics suffer from the same problems with respect to the Soviet Far East as with the rest of the Soviet Union: lack of recent statistics, the statements of changes in terms of percentages of previous years rather than in absolute numbers or amounts, and unreliability of reports. Under these handicaps, the author has been skillful in translating older figures into newer estimates where this appeared feasible. In other instances, and, unfortunately, this applies to a large part of the statistical information, the author has been forced to be content with information from pre-World War II or the early 1930's. Scattered here and there, however, is a considerable collection of information dating as late as 1950–52.

The discussion of the different ethnic groups brings out the interesting information that in 1939 there were 88,000 Chinese in Siberia, a considerable reduction from a reported 300,000 in the early 1930's mentioned by some earlier writers. Half of the Chinese are in the southern Ussuri region, but only 6 per cent are women. Many of the men have intermarried with the Udek tribes of indigenes who have been strongly influenced culturally by the Chinese. By contrast, some 170,000 Koreans were enumerated in 1939, of whom 100,000 were in the Ussuri region. These people migrated northward with their wives and families. Thiel adds that part of the Koreans have migrated to Soviet Turkestan where they raise rice in the Ili and Syr Daria River regions. Everywhere except in the extreme northern regions, however, the Russians outnumber the indigenous peoples. Thus, in the Buriat-Mongolian ASSR, the 280,000 Buriats in 1939 formed only 43.8 per cent of the population as compared with over 52 per cent for the Russians. Formerly prosperous nomad pastoralists, the Buriats have increasingly been forced into farming occupations if for no other reason than that the Russian settlers dispossessed them of their best pastures and prevented their nomadic roaming over traditional circuits. Even in the so-called Jewish Autonomous Region only about half of the 108,400 inhabitants in 1939 were Jews.

In contrast to the rapid growth of population in the 1926–39 period when the rate of increase was 75 per cent, the recent rate of growth has slowed down, being only about 35.6 per cent for the period 1939–50. The author bases this on calculations from the annual average rate of growth for the Soviet Union as a whole during 1926–39 of 1.22 per cent and from the difference in population of 4 million in 1939 and 6.3 million in 1950. Natural increase accounted for only 538,000, while the remaining 1,722,000 increase came from forced or natural immigration. Using similar methods of calculation, estimates for city populations bring Vladivostok and Kharborovsk into the 300,000 class, with Komsomolsk, Voroshilov, Ulan Ude, and Chita having risen to the 150,000 class. Three others are listed in the 50,000 class, including Magadan on the coast of the sea of Okotsk. Respecting the latter, the author says it is understandable why a town like Magadan has grown to such an extent. The long, costly transport between settlement centers and developed regions requires that each important center be provided with the variety of industries necessary to give the region self-sufficiency. To accomplish this requires a large working population.

Food production also is a basic aspect of this struggle for self-sufficiency. While the production of cereals in 1947 had risen by 150 per cent over 1913 for the region as a whole, and of potatoes by over 200 per cent, the population has increased 300 per cent, so that the problem of food for the Soviet Far East is as grave as ever. The dependence on food imports has been reduced by strenuous efforts to increase potato and soybean production, while the entry

of surplus producing Manchuria into the Soviet sphere appears to have solved the regional food supply problem. The Far Eastern fisheries not only supply the Soviet Far East but also other parts of the Soviet Union. In 1938 the Far East provided 25 per cent of the Soviet fish catch as compared with only 23 per cent for the Volga-Caspian Fisheries. For 1950, 2.2 million tons were planned for the entire Soviet output of fish as compared with 1.49 tons in 1938. Ninety-six per cent of this goal was attained, while at the same time the Soviet Far East over-fulfilled its quota by 50 per cent. It is evident, therefore, that the percentage contribution of the Far Eastern Fisheries had strengthened considerably.

In the miscellaneous mineral productions of the Soviet Far East, the significance of Sakhalin petroleum can not be over-emphasized, according to the author. It provides for the industrial requirements as far as Trans-Baikalia, as well as for sea and coastal shipping and the needs of the Far Eastern Red Army. Without it, oil would have to be brought from overseas or via the costly 7000–8000 km. Trans-Siberian rail haul. Production in 1950 reached 1,200,000 metric tons, while plans were in progress to raise production by 1953 to about 2 million tons. In this connection, it has been known for some time that an oil pipeline was being or had been laid across the Tartar Straits to bring the oil from the island to the mainland at Nikolaevsk. Thiel reports that in 1952 an earthen dam and causeway had been completed connecting the island with the mainland, so that cold sea currents no longer were able to move southward through the straits into the Japan Sea. What effect this will have on the pattern of cold water movement in the seas north and south of it is not revealed. The oil pipeline is on or parallel to the causeway and continues past Nikolaevsk up the Amur to the Komsomolsk and Kharbarovsk refineries.

The author cannot confirm reliably that the Baikal-Amur-Magistral or North Siberian Railroad northeast of Lake Baikal has been completed, although it has been under construction since 1938. It has a length of 3500 kms. and runs through a region scarcely populated and little known. However, the author forecasts that this will mark the beginning of a string of settlements along the new railroad, pushing northward Soviet settlements in the Trans-Baikalian region.

Although no photographic plates illustrate the book, 37 maps, charts, and tables form helpful aids, while 231 sources in three languages in the bibliography provide a useful directory for students desiring to do their own research in the field of the Soviet Far East. To this list the present volume adds a substantial and up-to-date contribution.

HEROLD J. WIENS

Yale University

Naissance d'une grande cité: Le Mans, au milieu du XXe siècle, by Jean Gouhier. 184 pp., maps, graphs, tables, bibliogr. Cahiers de la Fondation Nationale des Sciences politiques, No. 45, Librairie Armand Colin, Paris, 1953. 600 francs. 9½ x 6 inches.

This is a study of the capital of a Department in western France that has had an inconspicuous history, though its life has been abruptly changed by the sudden acquisition of big heavy industry and by a consequent rapid growth of population. The juxtaposition of large numbers of working families and the native citizens of Le Mans, of a vast new industry alongside the old town, of two different psychologies and sets of social attitudes—raises challenging problems in the life and organization of the city that need prompt understanding and action.

The site of the old town is just above the confluence of the Huisne and the Sarthe. These rivers flow through an alluvial plain, flanked by low buttes, that opens out just below the confluence into a large flat plain, mostly heath covered with meadow and some marsh. Down to the late thirties the town grew steadily as a commercial and industrial center, and the industries, notably two large engineering plants, were allied with local resources and enterprise. All these activities were closely integrated in the life of the town. The city grew around its medieval nucleus and the 19th century extensions took the form of a standard one or two storey house with a large garden.

Then came the war years and abrupt growth. Le Mans had for years been considered as a likely site for strategic industry since it has rapid communications with Paris and is well removed from the eastern frontier. In the late thirties two such plants were established on the heath covered plain south of the town and near the big marshalling yards. One plant made cartridges, the other aeroplane engines. Houses were needed for immigrant workers (key men coming from Paris) and had to be rapidly constructed. The biggest plant was established by Renault, which had already bought 200 hectares on the plain in 1920–22. After its strikes of 1936 the Renault concern started construction at Le Mans. This was the beginning of the mammoth engineering plant that now exists, reconstructed and extended since the war. This plant is today the chief producer of tractors in France.

The principal industrial plants of Le Mans (ten in number) employ about 10,000 workers and of these Renault alone employs 4000. The majority of these workers have had to find accommodation in Le Mans, which is thus very overcrowded, although houses have been rapidly built in small clusters near the plants. About 20 per cent of the workers, however, live outside the city limits and come from long distances, mainly by bicycle and to an increasing degree

by bus. A large part of them are small cultivators with patches on the heath who still cultivate their land during their time free from work in the factory. The influx of workers has come mainly from the surrounding countryside and is largely young in age.

In 1946 Le Mans reached the status of "une grande ville" with over 100,000 inhabitants (100,455, but 129,646 with contiguous urban areas). Since 1936 the birth rate has doubled, due to the normal post-war increase, as well as to the large numbers of young immigrant couples. The death rate has decreased. The population has become younger and healthier.

While the growth of population has been felt in all parts of the city it has been by far the greatest in the southern district (74 per cent increase since 1936). The great influx of people has meant overcrowding in the city as a whole, demand for housing, the mushroom growth of services (such as cinemas and commercial services), as well as changes in traffic rhythms and the increase of traffic congestion. We find today a revitalized city seeking to harmonize its diverse elements through the formulation of a master plan. The city's slums must be cleared. New houses in large numbers must be built in a properly planned suburban zone, and provisions made for the new flows of traffic. Harmony must be sought between two distinct groups, the Le Mans citizens and the new workers and their families. A bibliography, tables, and graphs, and 16 small maps complete this fascinating study of rapid urban growth and its attendant social, economic, and planning problems.

ROBERT E. DICKINSON
Syracuse University

The Limits of the Earth, by FAIRFIELD OSBORN. x and 238 pp.; bibliography. Little, Brown and Company, Boston, 1953. $3.50. 7¾ x 5½ inches.

Here is a book which, though written for the general public, merits the special attention of geographers and of all other individuals who are interested in the problems of population and world food supply. The author states that his basic purpose is "to stress the influence, both as regards past history and the present world situation, exerted by the relationship between people and the resources of the earth." In carrying out this purpose he has organized his material on a regional basis, investigating each region to determine its capabilities of contributing to its own support and to world food supplies in general. Thus, the *Limits of the Earth* is geographic in nature, although from a geographic standpoint it leaves much to be desired.

The present work might be considered a sequel to the author's previous book on resource utilization, *Our Plundered Planet*. The new book shows a minor though significant retreat from the extremist views presented by the author in 1948, but still maintains the view that birth control is the panacea for both present-day and future inequalities in food supply. Any research which is undertaken with such dogmatic views must of necessity result in a product that is subject to suspicion. Being forewarned is forearmed: this book must be read with caution and discrimination.

Mr. Osborn clearly reveals his basic philosophy in the last chapter when he states that population control is the solution to the ever-present race between food supply and numbers of people, and also that education is the means of expediting the plan. The possibility of another solution to the problem is recognized, but has been written off thus in a previous chapter: "Its story [South Africa's], including some of its historical aspects, has been related here in some detail because this country so vividly refutes the statement frequently made that the world problem of adequate food supply can readily be solved if present technical knowledge regarding agriculture could be generally put into practice" (p. 123). It is this statement and others like it that allow grounds for challenge. How can Mr. Osborn and his advisors claim that birth control, a system which requires education of every individual on earth and which is contrary to the religious and ethical teachings of a significant segment of the world's population, is any more practical or practicable than the spread of agricultural technology, which would be aimed at a much smaller group of people—landowners and those who till the soil? Evidently, dogma has brought forth inconsistency. Wouldn't it be more reasonable to recognize the difficulties encountered in any plan for mass education and thus press for a more immediate twofold attack on the problem of world food supply: increased food production by means of technological advance along with the attempt to limit population?

Aside from philosophical difficulty, *The Limits of the Earth* suffers from general overzealousness. The author is guilty of some of the sins of the environmentalists in our field. He has accepted easy solutions to problems because they fit his designs. For example he insists on explaining the downfall of past civilizations on the basis of resource failure, a partial explanation convenient for the purpose of the book. This sort of misstatement is carried to its most ridiculous extreme in the chapter on Europe, where the author gives credence and respectability to the great lie of the Kaiser and Hitler: that overpopulation was the cause of the past two great wars in Europe! Other such instances in the book arouse suspicion instead of lending force to the arguments set forth.

There are two other serious shortcomings which may have resulted from the fact that the

book was designed for popular consumption. First is a singular lack of good documentation of ideas and statistics. This is in small measure remedied by the inclusion of a selected bibliography at the end. Second, there are no maps or other visual aids, nor is there evidence of map analysis previous to writing the text. It is inconceivable to the geographer that a work such as this with the avowed purpose of examining areal relationships could be considered complete without maps.

It should not be inferred from this critique that *The Limits of the Earth* is a total loss, else it would be senseless to devote this much space to it. There is one chapter in the book which alone makes it worth reading: the author's analysis of the Amazon area stands out with singular merit. It is a mature and effective appraisal of a much misunderstood region of the world. This analysis is both sensible and provocative, and leaves the reader with the wish that the rest of the book were like it. Perhaps the author will some day favor us with a work which displays this same maturity throughout.

Credit must be given Fairfield Osborn. He is a courageous, if opinionated, man, who has twice spoken out for a plan to solve the dilemma of world food supply. He has provoked argument and aroused thought, and above all he has made people in the non-technical world cognizant of the grave problems that face us.

BART J. EPSTEIN

Stop & Shop, Inc.
Boston, Mass.

Shanghai: Key to Modern China, by RHOADS MURPHEY. xiii and 232 pp.; maps, diagrs., bibliogr., notes, index. Harvard University Press, Cambridge, 1953. $4.50. 6½ x 4 inches.

Nearly one-tenth of the human race lives in the hinterland of Shanghai; some 225,000,000 people look to the outside world through this port at the mouth of the Yangtze. Small wonder that Shanghai has 5 million people, and rates among the world's half dozen largest cities.

Rhoads Murphey has put together an excellent analysis in the 232 pages of his new volume. After an introduction and a chapter on politics and population, there follow chapters on site and on location. The opening of the port and political factors then account for a chapter each. Four functional chapters come next, with an analysis of transport and trade in the hinterland, foreign commerce, the food supply, and the geography of manufacturing. A final chapter evaluates Shanghai today and tomorrow. The book closes with 18 pages of bibliography and notes. There are two dozen maps, graphs, and tables; but only two of the maps deal with Shanghai itself, neither of them adequate. There are no photographs, so that Shanghai is an abstract place rather than a unique city with real people. Never is the reader conscious of being *in* Shanghai; the problems are always viewed from the outside.

The growth of Shanghai has been unique. When civil war brought distress to the interior, people and capital fled to the foreign concessions for safety so that business boomed. When China was peaceful, trade prospered and the city grew accordingly.

All students of China will welcome this volume. It covers many facets of the economic and political setting, but does not fully develop cultural factors. The hinterland is more fully described than the urban morphology. One might wish for a more penetrating sense of the geographic aspects.

The final chapter on the present and the future makes it clear that normal conditions have not existed since the Japanese attack in 1932; in fact there have been interruptions since the mid-1920's. Following 1952, the Nationalist blockade has reduced the city to a virtual state of siege in its international relations. The city has little excuse except as an entrepôt, so that its future depends on a restoration of free foreign trade. Not since the capture of St. Petersburg has Communism taken over a major seaport, and it will be interesting to see whether an economy along Soviet lines can return prosperity to a city which has functioned as was the case with Shanghai. Murphey concludes, "The geographic facts which have made Shanghai will prosper it in the future once peace has been restored to East Asia."

GEORGE B. CRESSEY

Syracuse University

Management of Agriculture and Food in the German-occupied and Other Areas of Fortress Europe, by KARL BRANDT and associates. xxxiv and 707 pp.; maps, tables, bibliographies, appendix notes, index. A publication of the Food Research Institute of Stanford University. Stanford University Press, 1953. $10.00. 9¼ x 6 inches.

Superb technology and genius for organization thwarted by lack of a sense of social justice and of a decent basis of human relations: this is the central impression one gets from this study of German management of food supply during war. Here, we see another aspect of the tragedy of this lack of balance in human social behavior, a failing we may be inclined to attribute to Germany especially, but one so general that none of us can afford to be smug. Much more than this, however, is to be had from this historical study, which appears to be based on thoroughgoing documentary research and on the firsthand knowledge of two Germans in-

volved in wartime food management: Dr. Otto Schiller and Dr. Franz Ahlgrimm.

The book deals separately with food management practices in each of the countries occupied by, or politically subordinated to, Germany during the War. It had to deal separately because the pattern was different in each country. This was partly because of the different circumstances in the separate states, as to production, food requirements of the population, and so on, and partly because the prejudices of Hitler and his associates led to differential treatment of different peoples. There were also almost unexplainable differences in administrative organization between countries, as if the Nazis were trying out different arrangements to see which would work best.

Generally speaking, the Reich administrators showed a high degree of intelligence concerning the agricultural geography of the countries being dealt with—their productive capacities, production requirements, distribution patterns, and so on. The book summarizes the agriculture of each country or occupied portion as background for the reader's understanding of the food administration problem there. It reveals much about the geography of European agriculture that will be worth reading by those whose interests lie in that direction, although this is not the book's main feature. It does not pretend to give a systematic characterization of agriculture or agricultural geography. Its subtitle, "A Study in Military Government," indicates the kind of process it has sought to record, analyze, and interpret. One hopes that the kinds of problems described are those that will seldom have to be dealt with hereafter.

Perhaps the most significant thing the book records about Nazi administration of food supplies is the thwarting of capable administrators by special agents with overlapping authority, in many cases responsible directly to Hitler. This was not universally true, however. It was particularly in the East that onerous treatment and unreasonable demands upon the farm people, often carried out over the protest of the German agricultural administrators, destroyed the possibility of the Reich realizing the potential benefit it had anticipated from conquered food-supplying territories. In Denmark and the Netherlands, in contrast, through the application of incentives to production, and the absence of onerous treatment, production was maintained and successfully directed toward the ends desired.

A second significant observation is that agriculture responds best to an impetus for increased or redirected production where it is already highly developed, as in Denmark, rather than where it is less highly developed, as in Hungary. This leads the authors to observe that "the staying power of production under the impact of war is higher in a highly-developed and organized agricultural system than in a primitive one." One wonders how well this generalization would apply to a system dependent so largely on gasoline as our own agriculture is, with refinery capacity subject to aerial attack.

The German experience does tend to support Dudley Stamp's conviction that potential production increases are greater in some of our so-called "developed" countries than in the "underdeveloped" ones.

The authors seem to have justified the claim, made in their introduction, that they have tried to do a good job of reporting rather than to pass judgment on the morality of what occurred.

This book has much that should interest students of history, public administration, political science, and geography. It leaves one with a feeling that we need to work harder and longer on the age-old problem of how a tyrant maintains his mastery of intelligent men, who have weapons, even whole armies at their disposal, yet permit themselves and their skills to be used for his ends.

CARLETON P. BARNES

Washington, D. C.

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